2016

connected lighting management

design guide

delmatic

2016

delmatic

Delmatic are leading suppliers of advanced lighting control and management solutions.

We specialise in open protocol networks using DALI, LON and BACnet, and develop sustainable systems which seamlessly integrate lighting, HVAC, solar shading and other services.

We've been supplying systems to major projects for more than fifty years and are always at the forefront of technology, leading the industry with innovative ideas and new concepts to save more energy, enhance sustainability, simplify installation, reduce capital cost and make advanced controls intuitive and accessible to all.

We work with project teams from the earliest days of concept design, through detailed development and application of systems to handover, and subsequent monitoring and ongoing optimisation.

With offices in London, Abu Dhabi, Dubai, Qatar and Saudi Arabia and partners in key global markets, Delmatic provide an unmatched technical resource for international project teams delivering sustainable solutions for an international client base.

Sheffield University, Engineering Faculty, UK

Crossrail, London, UK

Central Bank of Kuwait Headquarters, Kuwait

Emirates Towers, Dubai

SAMBA Headquarters, Riyadh, Saudi Arabia

Riverwalk Apartments, London, UK

Cleveland Clinic, Abu Dhabi

Abu Dhabi International Airport, Abu Dhabi

MRC Laboratory of Molecular Biology, Cambridge, UK

The Gherkin, London, UK

The Shard, London, UK

ADIC Headquarters, Al Bahr Towers, Abu Dhabi


Qatar National Museum, Doha

Ministry of Foreign Affairs, RIyadh, Saudi Arabia

Delmatic supply intelligent hardware and smart software to
provide every degree of control flexibility,
manage every type of light source and
suit every type of application.

everything **managed** and **monitored**

Delmatic Lightscape ® software is the client's window into the lighting installation - an interactive graphical tool displaying comprehensive, real-time information on lighting and system operation while providing powerful tools for monitoring and managing lighting across one or more locations.
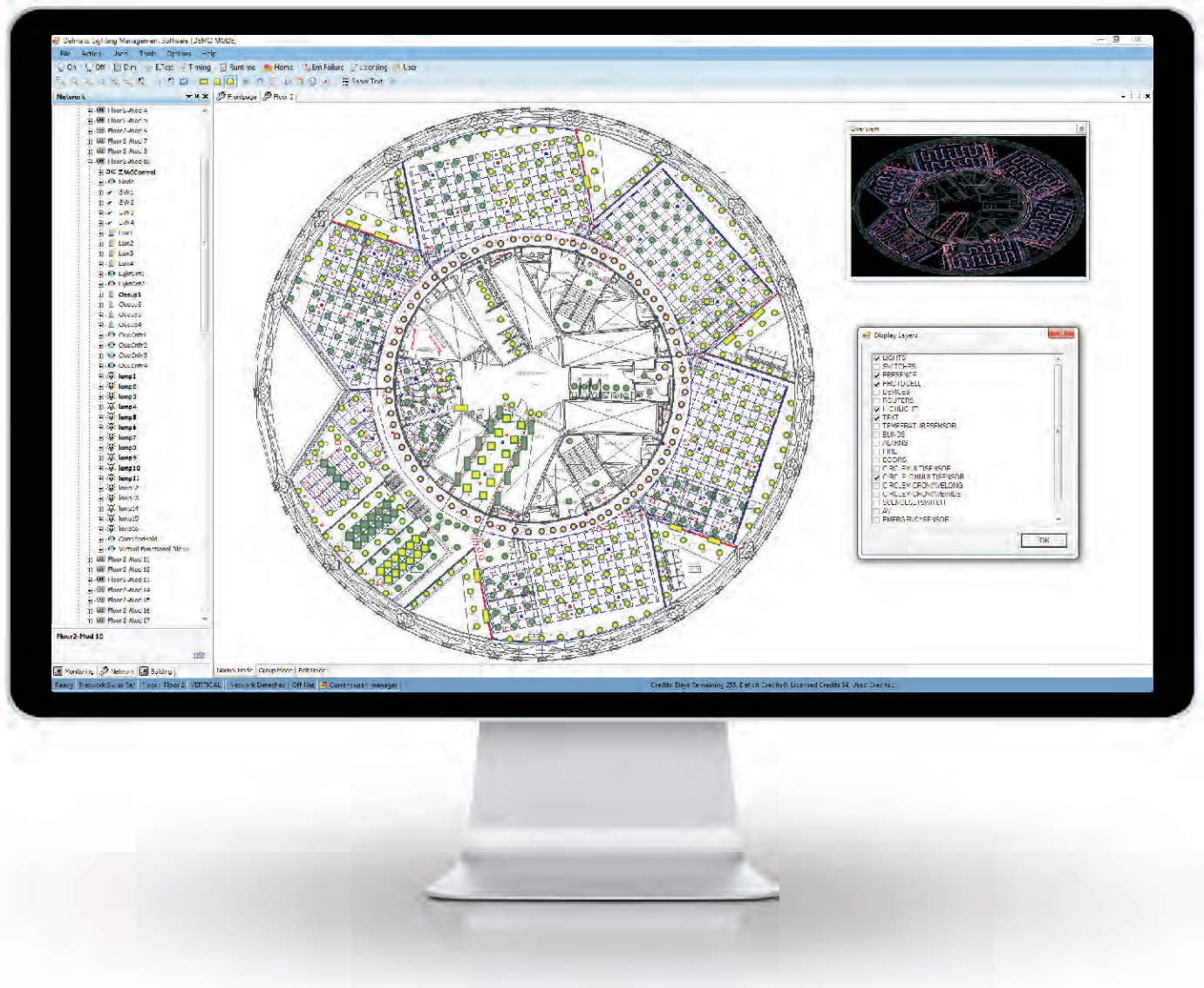
WYSIWGO

What you see is what's going on - in real time.

A comprehensive graphical interface identifies each luminaire against background building and lighting layouts, while a hierarchy of access levels determines the monitoring and management tools available to individual users.

Server or cloud-based software uses virtual-wiring routines and drag-and-drop tools to adapt lighting configurations in real time, instantly revising control arrangements to match changes in space planning and zoning.

real time monitoring

- remote monitoring from anywhere
- active status of each luminaire and device
- dynamic feedback from network hardware
- real-time Dali lamp and ballast failure

virtual wiring

- software configuration of groups and scenes
- behaviour and personality assigned to lighting
- wizards and auto-binding routines
- virtual loadshedding scenarios

a host of sustainable features

- lamp run-hours and energy monitoring
- optimised luminaire relamping schedules
- configurable presence, absence and daylight control
- remote adjustment of presence and photocell thresholds

online calendar scheduling

- comprehensive calendar and time scheduling
- multiple time regimes and sequences
- astronomical solar clock routines
- biodynamic control scenarios

integrated emergency monitoring

- round the clock emergency monitoring
- logging of test results with auto backup
- fully configurable emergency test cycles
- asynchronous testing ensures safety

connected services share information

- open protocol system shares knowledge
- sharing knowledge optimises building efficiency
- open communication with BMS and other services
- seamless integration of HVAC, blinds, etc

multiple users, multiple locations

- multi-level password and access rights
- monitoring and management from any device
- configurable real-time alerts to remote devices
- hardware monitoring & self-healing diagnostics

intuitive, **individual control**

The sophistication and power of the lighting management system is matched by the level of control available to individual users.

The system accepts every type of control device - pushbutton switches, scene-set panels, Touchpanels, Touchpads, even mobile devices - each empowering users with intuitive, individual control.

With their contemporary design, optically-bonded screen and high-resolution graphics, Delmatic **touchpanels** deliver the ultimate in touchscreen looks and experience.

Precision-engineered from aluminium and glass, the ultra-cool touchpanels appear to float on the wall and can control a single office, a meeting or conference room, a whole apartment or an entire building.

Vibrant, animated graphics provide powerful, intuitive control as well as comprehensive configuration, dashboard and monitoring functions.
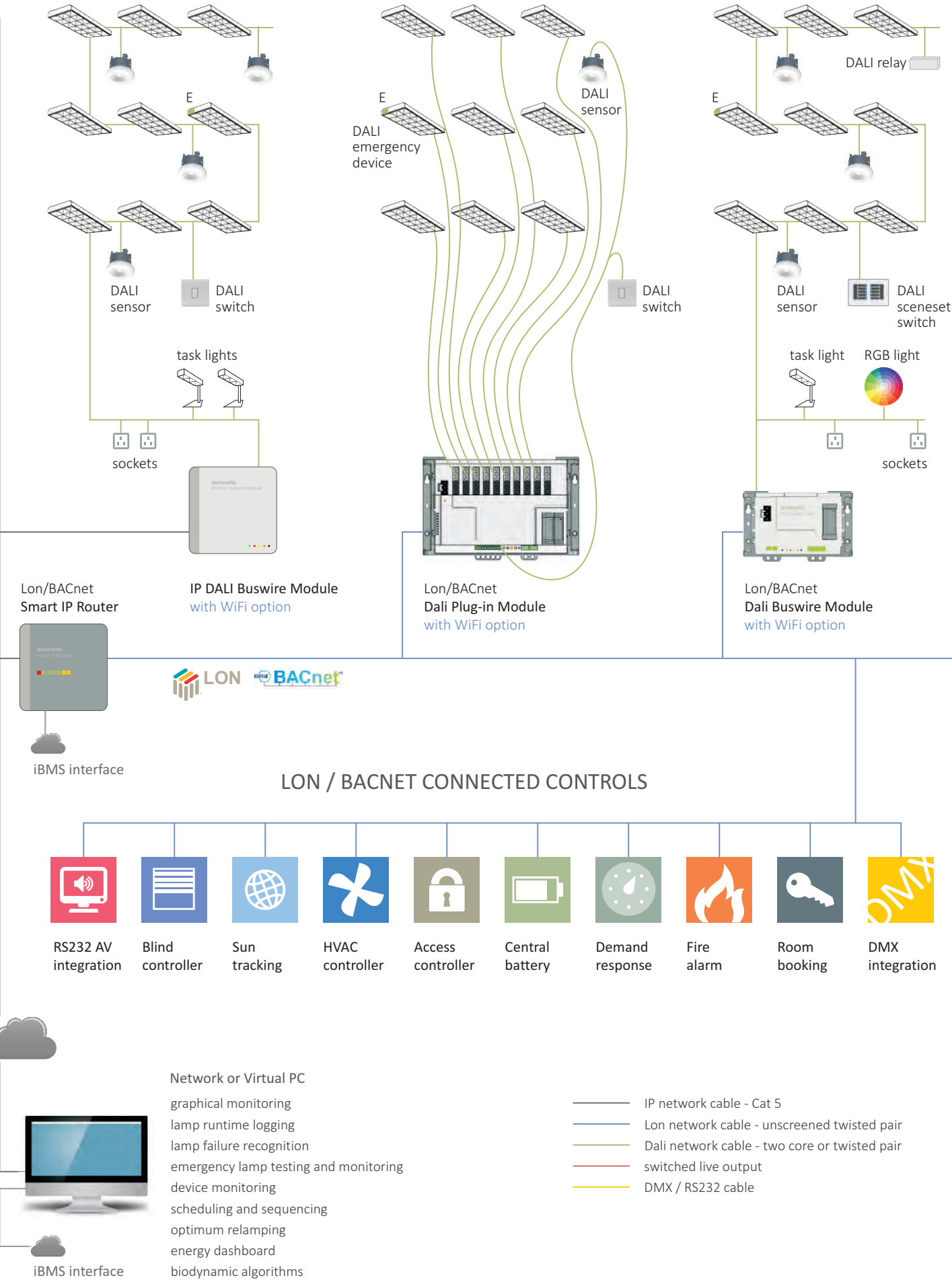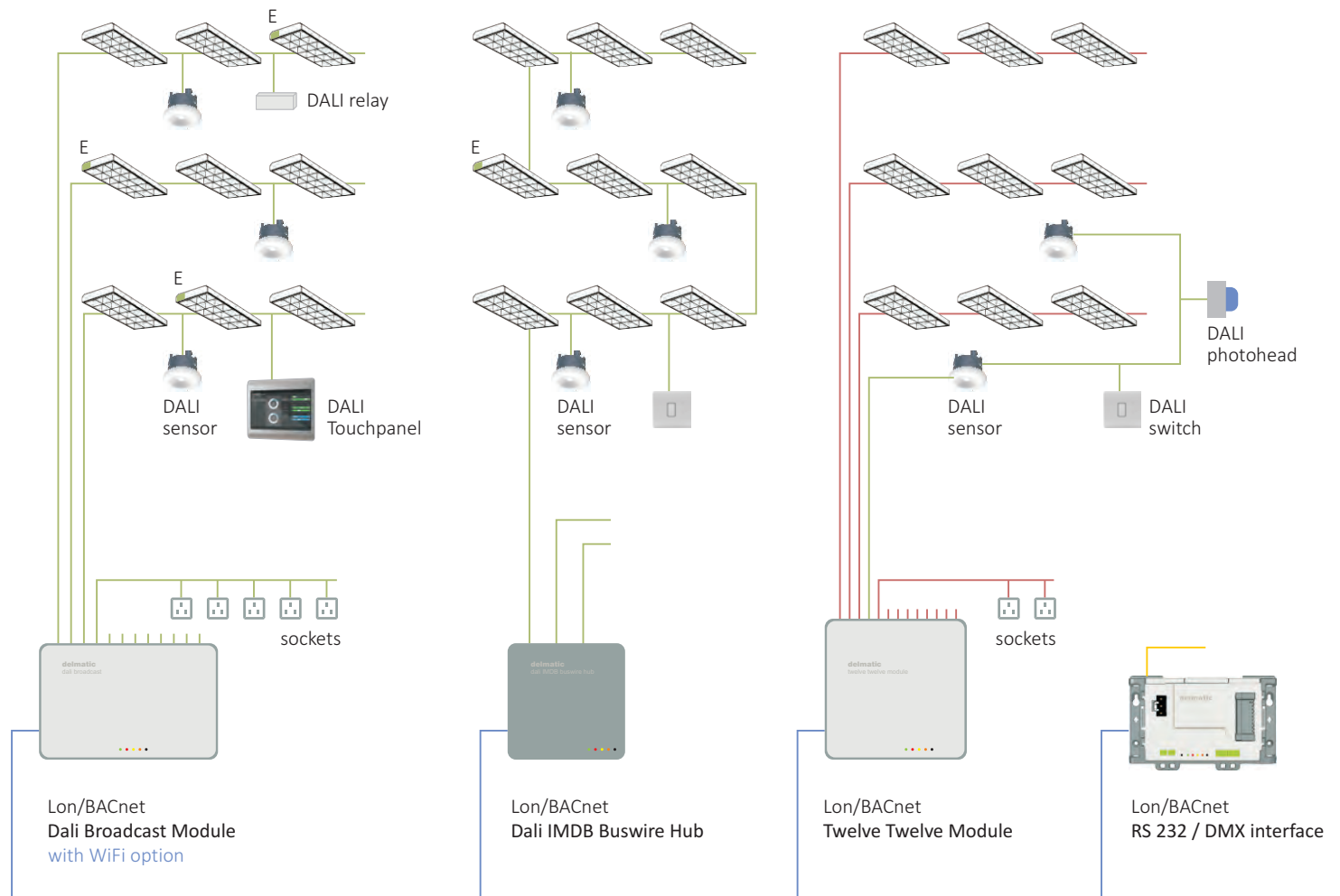
Delmatic **touchpads** provide the ultimate in touch convenience whether in an office, a meeting room, smart home, hotel room, patient room - or wherever.
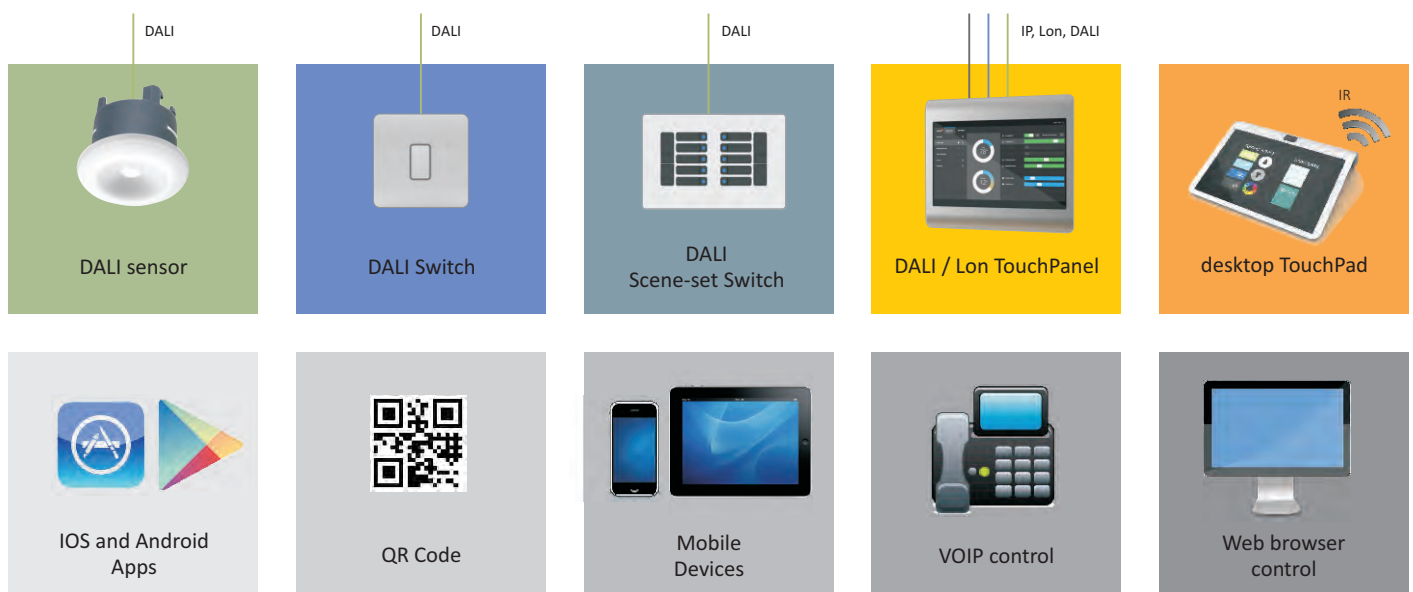
Crafted from aluminium and glass, the wireless devices provide powerful and intuitive control of lighting and other services.

NETWORK ARCHITECTURE

DALI relay

DALI sensor

E

DALI emergency device

DALI sensor

E

DALI switch

DALI sensor

DALI switch

E

DALI sensor

DALI sceneset switch

task lights

task light

RGB light

sockets

sockets

Lon/BACnet
IP DALI Buswire Module
with WiFi option

Lon/BACnet
Dali Plug-in Module
with WiFi option

Lon/BACnet
Dali Buswire Module
with WiFi option

Lon/BACnet
Smart IP Router

LON

BACnet

iBMS interface

LON / BACNET CONNECTED CONTROLS

RS232 AV integration

Blind controller

Sun tracking

HVAC controller

Access controller

Central battery

Demand response

Fire alarm

Room booking

DMX integration

Network or Virtual PC

graphical monitoring

lamp runtime logging

lamp failure recognition

emergency lamp testing and monitoring

device monitoring

scheduling and sequencing

optimum relamping

energy dashboard

biodynamic algorithms

iBMS interface

——— IP network cable - Cat 5

——— Lon network cable - unscreened twisted pair

——— Dali network cable - two core or twisted pair

——— switched live output

——— DMX / RS232 cable

delmatic.com

E

DALI relay

E

E

DALI
sensor

DALI
Touchpanel

DALI
sensor

E

DALI
photohead

DALI
sensor

DALI
switch

sockets

sockets

Lon/BACnet
Dali Broadcast Module
with WiFi option

Lon/BACnet
Dali IMDB Buswire Hub

Lon/BACnet
Twelve Twelve Module

Lon/BACnet
RS 232 / DMX interface

USER CONTROL DEVICES

DALI

DALI

DALI

IP, Lon, DALI

IR

DALI sensor

DALI Switch

DALI
Scene-set Switch

DALI / Lon TouchPanel

desktop TouchPad

IOS and Android
Apps

QR Code

Mobile
Devices

VOIP control

Web browser
control

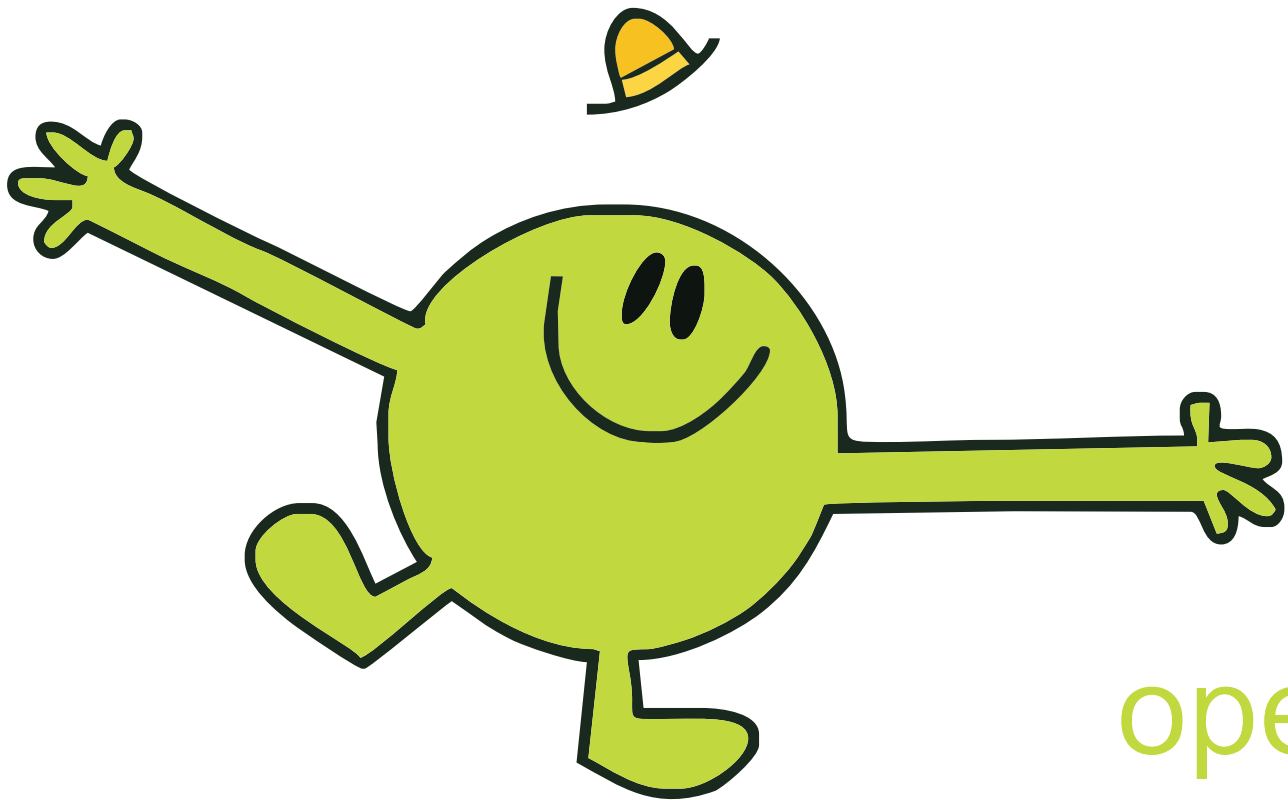# closed protocols

Closed protocols are trouble

They stop you sharing information.

They restrict flexibility and efficiency.

They lock you into one supplier. For life.

So, don't go there .....

open protocols

Open protocols are great

They give you choice, economy and efficiency.

They ensure multiple sources of supply and support.

They enable sharing of hardware and real time data.

They reduce capital and operational costs.

So, go for it .....

eliminate duplication

- eliminate duplication of hardware
- single network for all services
- reduce material and labour costs
- reduce maintenance costs

keep your options open

- interchangeable devices
- multiple vendors
- ensure long-term maintainability
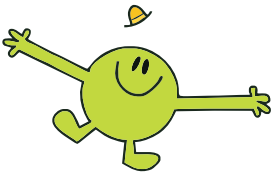- guarantee future-proofing

seamless connectivity

- total integration
- true device-level interoperability
- connectivity optimises efficiency
- enhance user control

open protocols

Open protocols and systems are at the heart of today's connected world.

So, what are the main open protocols for building controls?

DALI

DALI (IEC 62386) is the global standard for digital dimming enabling devices from different manufacturers to be seamlessly mixed and matched into interoperable networks.

DALI comprises a standard protocol that can be transmitted and received by any DALI ballast, irrespective of type or supplier and combines accurate, energy-efficient dimming with unique lamp & ballast failure detection.

The key tenet of DALI is interoperability and DALI 2 expands the standard to include sensors and switches, additional system addresses as well as enhanced reporting.

The DALI standard covers communication within networks of up to 64 luminaires, while most projects require multiple DALI networks to create a single lighting solution.

There is little point in linking open protocol DALI networks with closed protocols, so, to ensure totally open solutions, you need to combine DALI with other open protocols such as Lon or BACnet.

LON

Lon is a leading international protocol for integrated services detailed in ISO 14908 "Open Data Communication in Building Automation, Controls & Building Management."

Lon provides major advantages over other protocols such as KNX including a flat network structure, no single point of failure, polarity insensitive buswire as well as handshake acknowledgements and confirmed receipt of messages.

Lon also operates faster than other protocols - and at least eight times faster than KNX - a critical aspect in large, integrated building networks.

BACnet

BACnet is an international communication protocol detailed in ISO 16484 and a "Data Communication Protocol for Building Automation and Control Networks"

Delmatic modules coexist in both Lon and BACnet worlds, communicating and sharing strategic data, triggering tasks and reporting back events and system statuses - all across a single network buswire.

open protocol **interoperability**
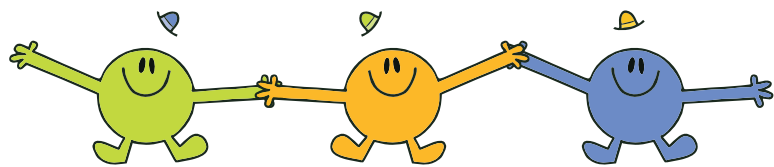
Open protocols enable controllers from multiple manufacturers to share network architecture and respond to open protocol messages from shared devices.

Interoperability achieves major energy savings, cuts capital costs by avoiding duplication of hardware, reduces installation costs, and achieves operational savings over the life of the building.

network outputs from devices
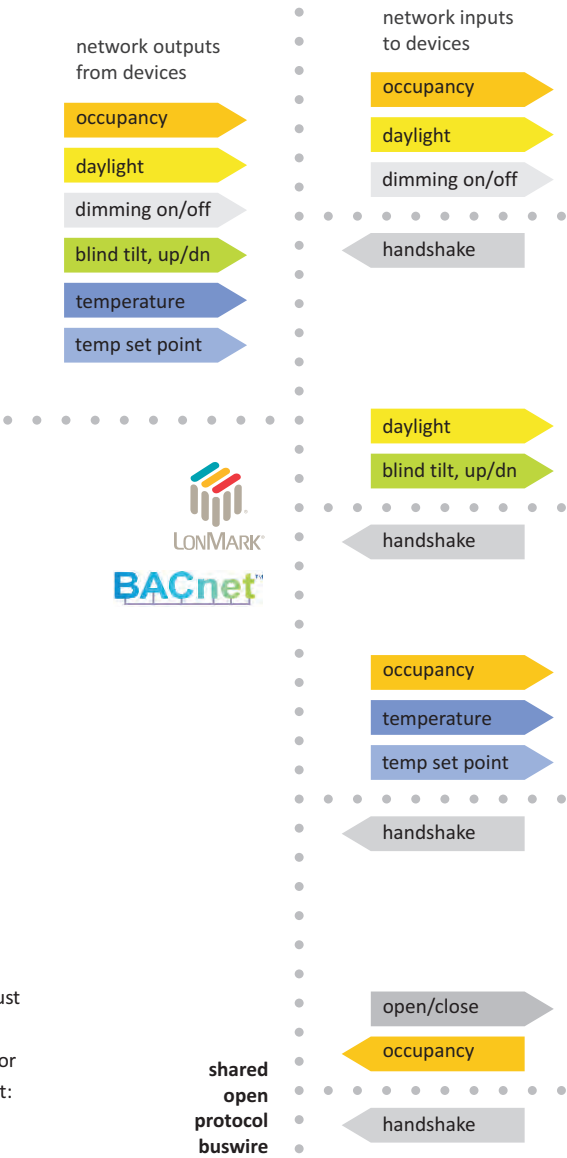
network inputs to devices

multisensor

The multisensor monitors occupancy and daylight, receives user commands from the touchpad, and transmits this data to the controllers on the network.

occupancy
daylight
dimming on/off
blind tilt, up/dn
temperature
temp set point

occupancy
daylight
dimming on/off
handshake

DALI lighting controller

Lighting is controlled based upon occupancy and daylight data from the multisensor as well as user level preferences and scenes entered via the touchpad.

LONMARK

BACnet™

daylight
blind tilt, up/dn
handshake

blind controller

Blinds are controlled based upon daylight data from the multisensor or solar tracking system as well as user raise/ lower/tilt adjustments entered via the touchpad.

occupancy
temperature
temp set point
handshake

VAV controller

HVAC is controlled by occupancy monitored by the multisensor, room temperature measured by the touchpad and user set-point entered via the touchpad.
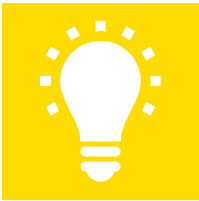
touchpad

The touchpad enables users to adjust lighting levels, raise, lower and tilt window blinds, as well as increase or decrease the temperature set-point: an integral sensor monitors room temperature at desk level.

shared open protocol buswire

open/close
occupancy
handshake

access controller

The access controller sends occupancy information on to the network which is used by the lighting and VAV controller to control and regulate services.

open protocol **integration**

MRC Laboratory of Molecular Biology

The new Medical Research Council Laboratory of Molecular Biology in Cambridge is one of the most prestigious research centres in the world, and the birthplace of modern molecular biology.

The advanced building incorporates renewable energy and heat recovery wheels while the integrated services network optimises efficiency by relating lighting and HVAC to occupancy. The Delmatic DALI system manages and monitors normal and emergency lighting throughout the building while powerful user control empowers occupants with control of lighting levels and scenes to best suit activities within each area.

JAFZA Convention Centre

The DALI system within JAFZA's next generation Convention Centre forms part of the CISCO Connected Real Estate IP Network - a converged infrastructure which merges IT with twenty building services systems and acts as the fourth "information utility" within the 73,000 sq.m centre.

The Delmatic system provides total DALI connectivity (with DALI drivers and ballasts, DALI presence detectors, multisensors, switches and scene-set panels connecting to a common DALI network) and shares data with other systems across the IT network and GPRS & WiFi infrastructure.
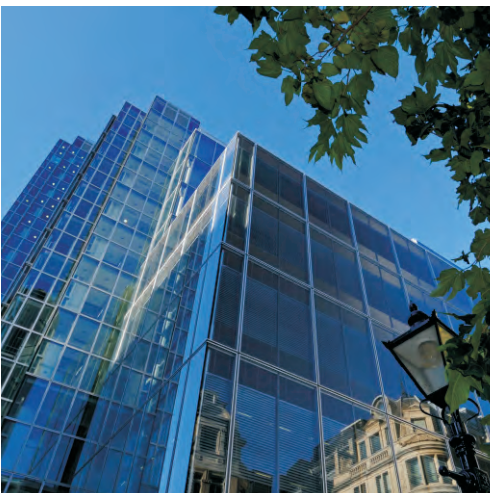
Drapers Gardens

Sustainability is at the heart of the 27,000 sq.m Drapers Gardens headquarters in London which incorporates innovative ventilated double wall cladding as part of a range of energy efficiency and sustainability features.

The design makes extensive use of natural light and the Delmatic DALI system monitors and manages lighting in all areas while seamlessly controlling and monitoring third-party blind and solar shading controllers across the shared Lon building network. Wireless user control of lighting and blinds combines with central management and monitoring through a single network interface.

open protocol integration

ADNOC Headquarters

The new Abu Dhabi National Oil Company headquarters is a prominent city landmark symbolising the company's importance in the development of the United Arab Emirates.

The 74 storey smart building is packed with energy efficient and sustainable technologies including photovoltaic glazing and intelligent integration. The Delmatic DALI system monitors and manages lighting throughout the 175,000 sq.m complex while shared Lon and BACnet data between the lighting, BMS, blind, fire, access-control and room booking systems enhances user comfort and productivity as well as optimising building and operational efficiency.

Sheffield University School of Engineering

The University of Sheffield's new Engineering School provides a state-of-the-art engineering faculty and a unique learning experience covering the full spectrum of engineering, from fundamental science to professional practice.

The Delmatic DALI system controls lighting across the 20,000 sq.m building including the 900 personal study spaces where innovative monitoring links each task light precisely to occupation. The integrated system contributes to the building's role of practical learning and shares comprehensive real time BACnet data allowing detailed control and analysis of energy management.
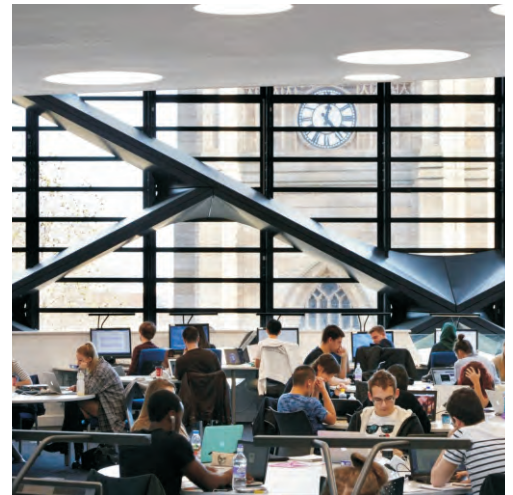
Abu Dhabi Investment Company Headquarters

The 100,000 sq.m headquarters of the Abu Dhabi Investment Authority was the first project in the Gulf to focus on sustainability and seamless interoperability between lighting, air-conditioning and solar shading blinds created the most integrated and efficient project in the region.

Lon integration between the lighting control modules, third-party blind controllers and third-party VAV controllers across a common network ensures all services relate to occupancy while Delmatic wireless touchpanels enable users to adjust lighting, shading and temperature.

how do you like your DALI ?

DALI is a single technology, yet there are multiple ways of applying DALI across the various areas of a project.

The optimal DALI approach depends upon the degree of flexibility required and the type of electrical installation within each area.

Delmatic offer a range of DALI modules to suit these different applications and systems combine modules and approaches to **optimise control and minimise addressing**.

Degree of flexibility	Type of installation	Typical application	Recommended DALI approach
Totally flexible Layouts are frequently changed so individual control of each fitting is required to enable switching and dimming arrangements to be reconfigured through graphical software.	Plug-in	Offices and areas with false ceilings.	**DALI Plug-in** Widely used to provide total flexibility with individual addressing and monitoring of each luminaire without the need to individually address drivers: also provides the speed and convenience of plug-in connectivity. **No on-site addressing required.**
	Busbars, chilled beams, suspended luminaires	Offices and areas without false ceilings.	**DALI Buswire** Provides individual addressing and monitoring of each DALI driver along a shared buswire. Ideal for installations with a single conductor (busbar), suspended luminaires and chilled beams (where plug-in connections are not practical). **DALI drivers need to be individually addressed on site.**
Fixed Layouts are unlikely to change so individual addressing and control of each fitting is not required.	Hardwired	Lobbies Core Areas Corridors Toilets Plant rooms Staircases Workshops Laboratories	**DALI Broadcast** Extensively used in shell and core areas to provide control and monitoring of DALI channels via pre-addressed outputs with no need to individually address drivers or ballasts. **No on-site addressing required.**

DALI plug-in

**DALI Plug-in provides maximum flexibility
with individual control and monitoring of every DALI fitting
as well as quicker installation and faster commissioning.**

The plug-in approach is ideal for areas with suspended ceilings
as it provides complete plug-in connectivity for lights and
devices and fully flexible control, without the need for
any on-site addressing.

DALI plug-in modules are smart hubs providing total flexibility,
rapid plug-in connectivity and out-of-the-box functionality
without the need to individually address DALI drivers on site.
In this way, **DALI plug-in modules** achieve major savings in
commissioning time and cost and simplify future maintenance.

- **intelligent smart hub for DALI fittings**
- **individual control and monitoring** of each fitting
- **total plug-in connectivity** for speed and convenience
- open **Lon and BacNET** ISO communication
- optional **WiFi** communication
- individual **DALI lamp and ballast failure**
- individual **DALI emergency light testing and monitoring**
- **pre-addressed** DALI outputs
- **no on-site addressing**
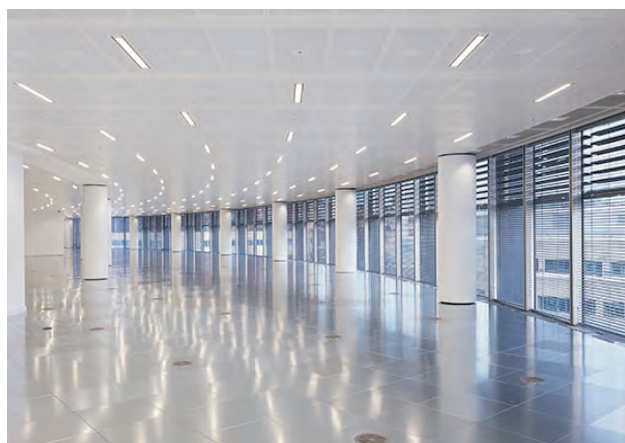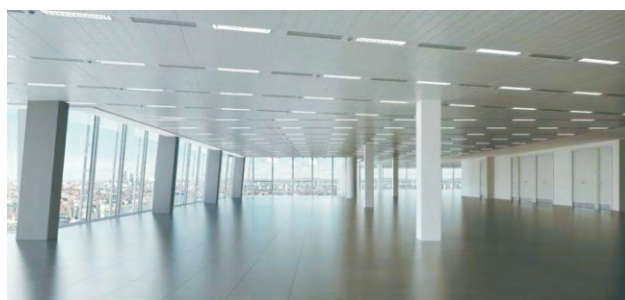
Widely used in areas with suspended ceilings,
DALI plug-in modules offer total plug-in connectivity,
acting as local hubs for the rapid connection of power,
luminaires and local control devices.
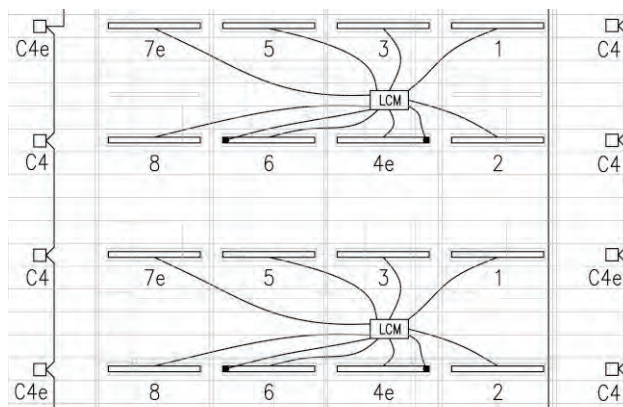
Detail of a typical plug-in module application.

DALI buswire

**DALI Buswire provides total flexibility with
individual control and monitoring of DALI luminaires
and devices along a shared bus.**

The buswire approach is ideal for installations with suspended
luminaires, chilled beams and busbar trunking as it provides
the unique ability to individually control and monitor
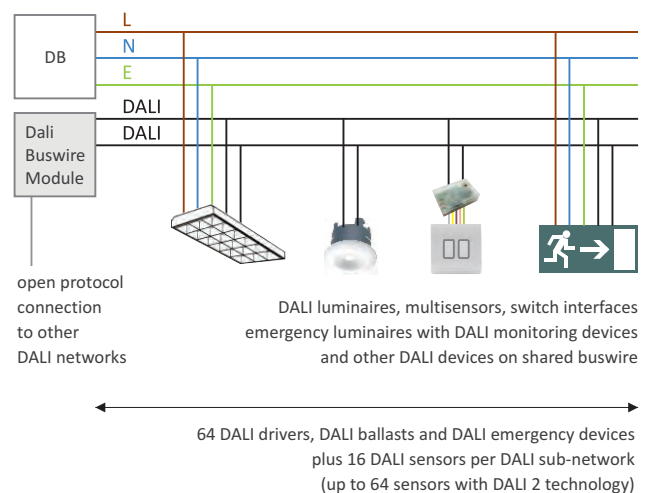luminaires along a common two core buswire or conductor.

DALI buswire modules are smart digital routers providing
total flexibility and monitoring of lighting and devices along a
shared bus. A DALI Buswire module connects to a network of
DALI devices including DALI drivers and emergency devices as
well as user devices such as DALI sensors and switches.

- **intelligent digital router for DALI fittings**
- **individual control and monitoring** of each fitting
- open **Lon and BacNET** ISO communication
- optional **IP** communication
- individual **DALI lamp and ballast failure**
- individual **DALI emergency light testing and monitoring**

The DALI buswire approach connects ballasts, drivers, sensors
and other devices via a polarity insensitive two core buswire
which can run beside mains cables powering the DALI luminaires.

Delmatic's approach of using the DALI bus for the connection
of DALI sensors and switches reduces network cabling by 50%.

open protocol
connection
to other
DALI networks

DALI luminaires, multisensors, switch interfaces
emergency luminaires with DALI monitoring devices
and other DALI devices on shared buswire

64 DALI drivers, DALI ballasts and DALI emergency devices
plus 16 DALI sensors per DALI sub-network
(up to 64 sensors with DALI 2 technology)

DALI broadcast

DALI Broadcast provides control and monitoring of channels of DALI lighting achieving powerful control of lighting across a large area.

The Broadcast approach is ideal for corridors, cores and other areas where dimming and monitoring is required but flexible control of individual luminaires is not needed.

DALI Broadcast modules are smart hubs broadcasting dimming commands to each DALI channel and providing the dimming and monitoring benefits of DALI without the need to address ballasts on site.

- **intelligent smart hub for DALI fittings**
- **control and monitoring** of DALI channels
- open **Lon and BacNET** ISO communication
- optional **WiFi** communication
- channel **DALI lamp and ballast failure**
- individual **DALI emergency light testing and monitoring**
- **pre-addressed** DALI outputs
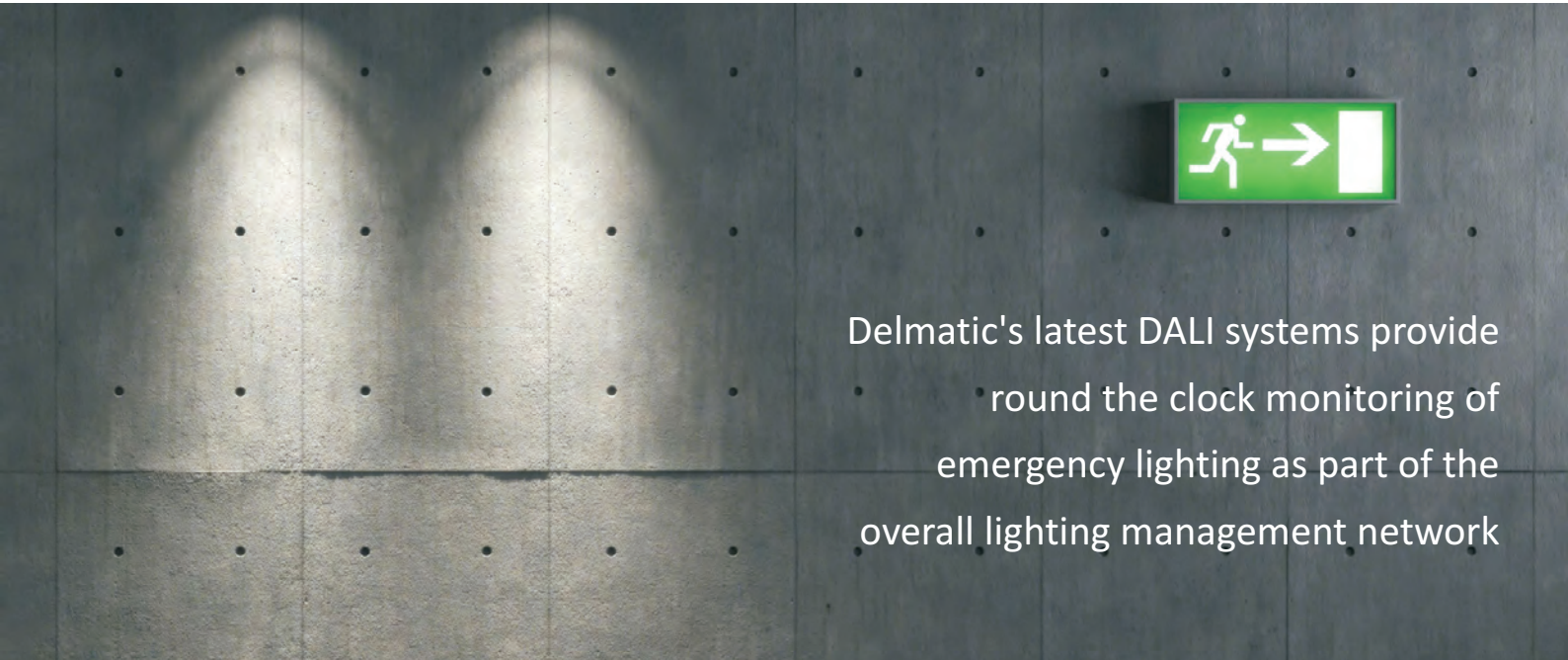- **no on-site addressing**

Widely used in core areas, DALI broadcast modules distribute individual commands to each DALI channel (eg. lobby, male toilet, female toilet etc).

Lighting circuits wire direct from the DB to luminaires while the DALI bus connects luminaires & devices on each channel.
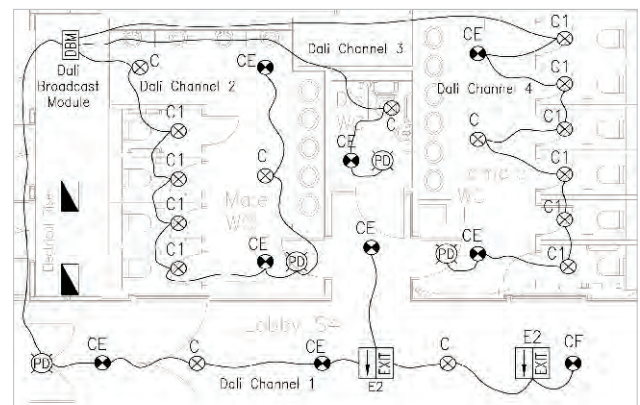
Detail of a typical broadcast module application.

Delmatic's latest DALI systems provide round the clock monitoring of emergency lighting as part of the overall lighting management network

e-testing and e-monitoring

Delmatic systems combine general and emergency lighting to eliminate the need for a separate emergency monitoring system, share network hardware and architecture, and simplify the process of emergency light testing for clients.

The advanced DALI system tests and monitors self-contained battery fittings, as well as fittings fed from central batteries, and brings the complete emergency light testing, monitoring and reporting process within one comprehensive package.

Automatic duration testing is carried out in accordance with international standards while active graphics monitor, log and display the feedback status of all luminaires, highlight and record lamp, ballast and battery faults and generate detailed online or cloud-based logs of tests and performance for maintenance, analysis and statutory purposes.
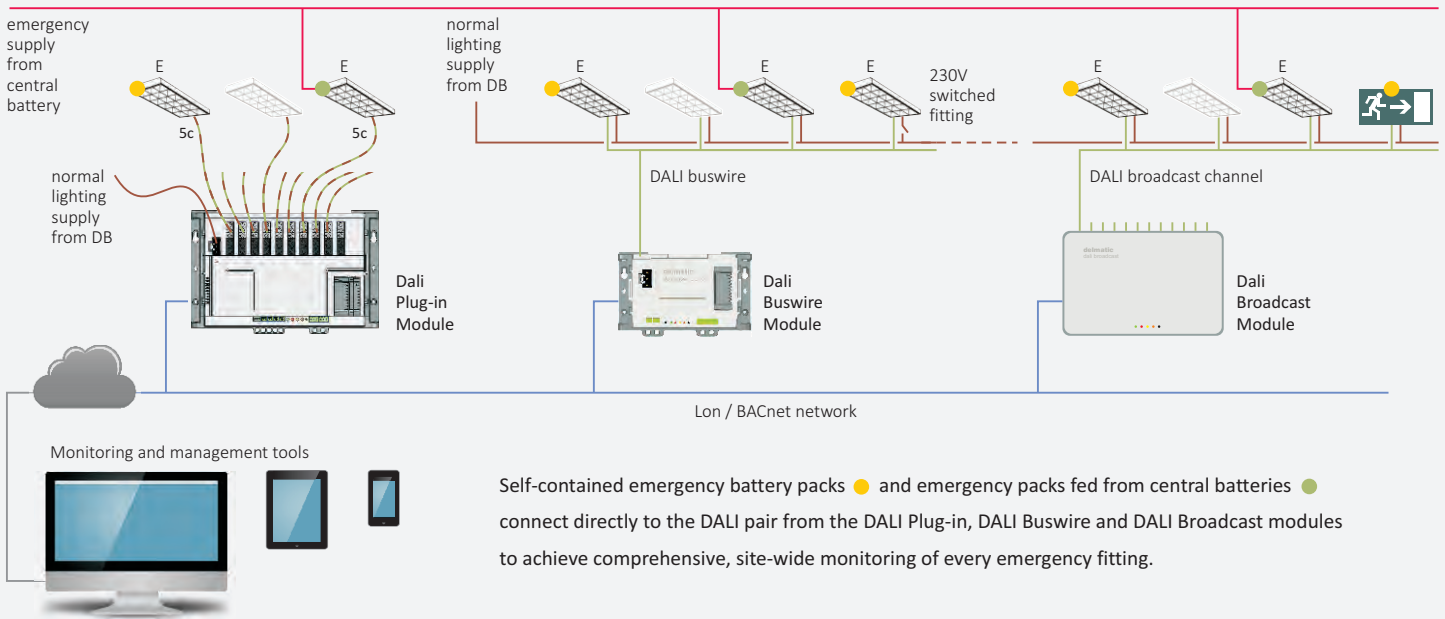
eliminate duplication

- single system achieves capital / installation savings
- shared hardware and network architecture
- cabling reduced as e-fittings connect to DALI bus
- common commissioning and maintenance

comprehensive monitoring and reporting

- automatic testing, reporting and logging
- data back up in tamper proof format
- tests scheduled to international standards
- manual test options with override features
- compatible with DALI-standard emergency devices

emergency supply from central battery

normal lighting supply from DB

normal lighting supply from DB

230V switched fitting

DALI buswire

DALI broadcast channel

Dali Plug-in Module

Dali Buswire Module

Dali Broadcast Module

Lon / BACnet network

Monitoring and management tools

Self-contained emergency battery packs ● and emergency packs fed from central batteries ● connect directly to the DALI pair from the DALI Plug-in, DALI Buswire and DALI Broadcast modules to achieve comprehensive, site-wide monitoring of every emergency fitting.

be prepared for a real emergency

There is little point in knowing that all is well with the emergency installation if an actual emergency situation occurs shortly after a full duration test when the batteries are depleted.

Delmatic's asynchronous testing configuration carries out sequenced testing of selected fittings to avoid all emergency lighting in an area being tested at the same time.

a site wide solution

Lighting within plant rooms and similar areas is traditionally not controlled as part of a lighting management system and is, instead, switched locally by mains 230V switches.

Emergency lighting within these areas, however, still needs to be checked, and this can now be tested and monitored as an integral part of the lighting management system.

dynamic emergency lighting

Delmatic's innovative dynamic emergency lighting option smartly illuminates the fastest and safest exit route dependent upon the source of an incident such as a fire or security alert.

Integration with other life safety systems shares data on the source of an incident so the lighting management system can energise lights in optimal patterns and control the direction of arrows highlighting escape routes.

light gives our life rhythm

The rising and the setting of the sun punctuates our lives
and provides a dynamic component to our day.

how do you feel when the sun is out?

Most people feel uplifted and agree that sunlight brightens their home,
their workplace and their life, and yet, for a long time, it was thought that
light was needed purely for seeing. Only in 2001 was it discovered that
the quality of light stimulates and regulates our body clocks and rhythms.

As the earth rotates around the sun, light levels and colour change from
cool blue daylight to a warmer light as dusk falls. These natural changes in
the quality and quantity of light stimulate circadian rhythms and regulate
hormones linked to alertness (cortisol) and relaxation (melatonin).
Cool white light with a blue tinge activates our senses and has a positive
influence on concentration while comforting warm white encourages
relaxation and assists regeneration.

biodynamic control

biodynamic lighting control

The same biological effects can be recreated in interior environments
using biodynamic lighting controls which simulate daylight from
blue morning skies through to the glow of sunset.

Delmatic's biodynamic lighting controls subtly adjust light intensity and
colour based upon algorithms which replicate the dynamic variation of
daylight and sunlight.

Biodynamic routines can be configured to mimic the rhythms of natural
light, offering a people-centred solution which counteracts the body's
tendency to be less alert at certain times of day, resulting in an
improvement in performance and the well-being of individuals.

Biodynamic scenes and routines can also be assigned to defined zones
such as meeting rooms, working areas, relaxation areas etc, so that
lighting intensity and colour relates to the activities within an area.

regulating light & temperature

Research demonstrates that
adjustment of ambient temperature
during the circadian cycle
can also achieve benefits.

Delmatic connected systems share
algorithms and occupancy data with
the BMS so temperature and climate
can be adjusted as an integral part of
the biodynamic routines.
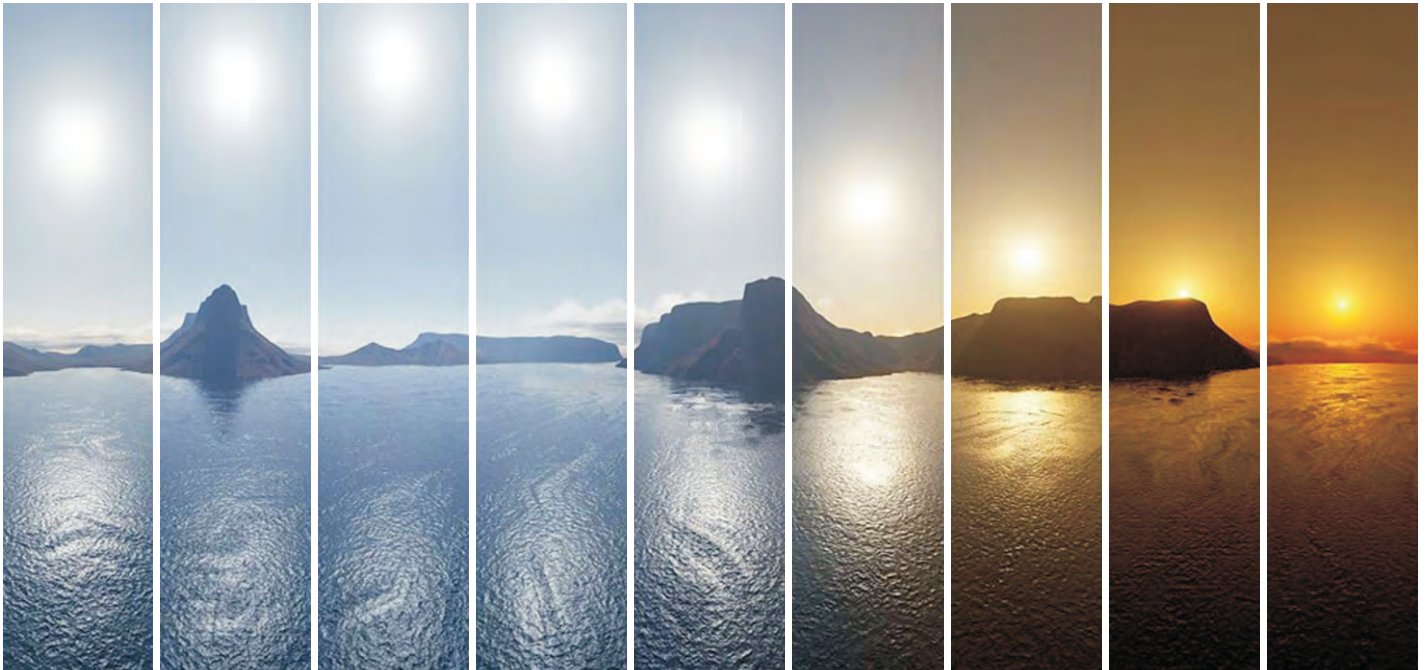
lighting controls can enhance energy efficiency by 40% .. 50% .. 60%, yet, if you can enhance the productivity of people by just one percent, think how much that is worth

Biodynamic control within working areas of Dubai Airport Terminal 1 adjust the colour and intensity of light throughout the day with specific algorithms for each workspace type - individual, group, break-out, meeting, etc.

Background uplighting is regulated to create a uniform colour mood within each workspace type while individuals adjust downlighting and task lighting via web-browser or App. Integral presence detectors and daylight-linking add energy-efficiency to this most advanced and dynamic control solution.

DALI zero power

Masdar Institute, located at the heart of Abu Dhabi's Masdar eco-city, is the world's first university focused on future energy and sustainability.

The Institute is powered entirely by energy generated from rooftop PV panels and remote solar arrays, so efficiency and sustainability are top of the agenda.

A Delmatic DALI system manages every watt of power across the city campus including study and research areas, laboratories, offices, recreation facilities as well as student accommodation.

The system continually adjusts lighting based upon occupancy and daylight while open protocol Lon integration shares real-time data with the BMS so that HVAC is also optimised according to occupation.

The Delmatic system receives data from the PV generation network and dynamically reduces load to match the finite renewable energy available.

The Institute is dedicated to cutting-edge, green solutions, and Delmatic pioneered the concept of **DALI Zero Power** for the project. DALI Zero Power eliminates standby power consumption by smartly managing the mains power to the DALI fittings**,** resulting in substantially increased energy savings.

The passive and intelligent system solutions save more than 70% in lighting energy with similar savings in cooling energy, making the Institute **one of the world's most sustainable facilities with a near net zero carbon footprint.**
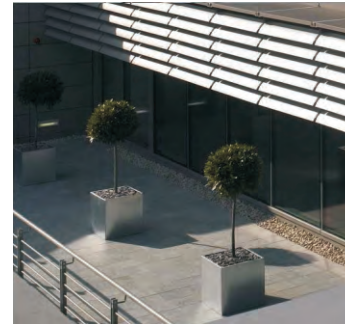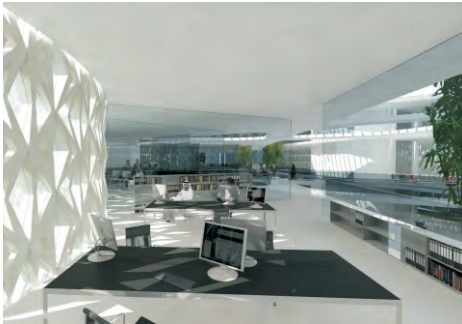
DALI solar response

Delmatic's latest **DALI Solar Response** systems optimise building efficiency and occupant comfort by combining control of lighting and solar shading.

Powerful astronomic software (with optional building shading analysis) tracks the position of the sun so that solar shading blinds and lighting levels are adjusted and precisely matched to the extent and incidence of daylighting.

Delmatic Solar Response systems avoid the need to install and configure photocell sensors throughout a building while providing total precision and accuracy of control.

Solar Response controls integrate with smart presence and absence detection so that lighting and blinds are set to maximise occupant comfort in occupied areas and to optimise energy efficiency in unoccupied areas.
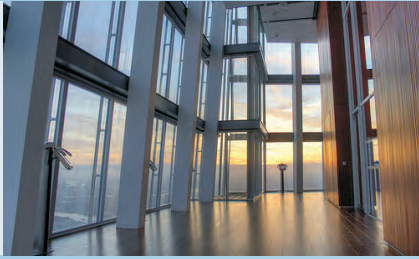
DALI
at the
Shard

The Shard is a text-book example of how to apply DALI technology.

DALI is used throughout the Shard and the system design demonstrates the benefits of adopting different Dali strategies within specific areas of a building.

Viewing galleries

Viewing galleries and external lighting require dramatic and flexible control.

DALI, DMX and switching modules provide scene-set control with scenarios based upon calendar schedule, solar clock and photocell.

Dali is used throughout the project - within shell and core areas, staircases, lobbies, toilets, front and back of house, viewing galleries, reception and retail areas as well as across the office fit-out floors.

Within each area, DALI is applied in different ways to best match the required flexibility with the preferred method of installation while minimising or completely avoiding the need to address Dali ballasts.

The project makes full use of Delmatic's extensive range of DALI hardware - DALI Plug-in modules, DALI Broadcast modules and DALI Buswire modules, DALI presence detectors, DALI multisensors, DALI switch-interfaces, DALI scene-set panels, DALI relays and DALI emergency monitoring devices - all managed and monitored in real time by graphical network software.

Office areas

Office areas need to provide total flexibility for tenants.

DALI Plug-in modules provide independent control of each lamp with individual lamp/ballast failure monitoring while plug-in connectivity speeds installation, is convenient for tenants and avoids the need to address DALI ballasts.

Shell and core and toilets

DALI broadcast modules provide control in fixed areas where a high degree of flexibility is not required.

DALI Broadcast modules control lighting channels and monitor lamp and ballast failure within shell and core areas and avoid the need to address DALI ballasts.

Staircases

Staircases suit a vertical network buswire installation yet need the flexibility to address lighting along the buswire.

DALI buswire modules enable sensors and lights to be individually addressed so that the route can be lit above and below the floor where motion is detected.

Reception and retail

Reception and front of house areas give a first impression of the building and need flexible scene control.

DALI Scene-set panels, DALI Broadcast modules and DALI multisensors provide scene-set and daylight-linked control of DALI and DMX lighting.

CrossRail and transport hubs

Crossrail is a new 118km,
high-speed rail network for London
and the South East and the UK's largest
ever single public infrastructure development.

Delmatic DALI systems are installed throughout the
central London stations to provide intelligent, secure and
energy efficient management and monitoring of normal and
emergency lighting.

The state-of-the-art systems play a key role in minimising energy
consumption and supporting Crossrail's goals to deliver energy-
efficient, sustainable solutions for London's transport network.

Delmatic's open-platform systems combine DALI and LON protocols
and integrate via SCADA with the BMS network for the sharing of real
time data and commands. The systems monitor individual lamp
operation and highlight lamp and ballast failures while, to ensure public
safety, innovative software automatically increases the output of
remaining lighting to compensate for lamp failures. The lighting
management systems integrate with the central battery network at
each station to monitor the performance of emergency lighting and
highlight any failures in real time.

The project included the development of a unique set of
BREEAM criteria for underground stations enabling
assessment of Crossrail's environmental performance.
Crossrail will be the first underground railway in the
world to be rated under the scheme and will
set a benchmark for future
transportation projects.

Dubai Metro
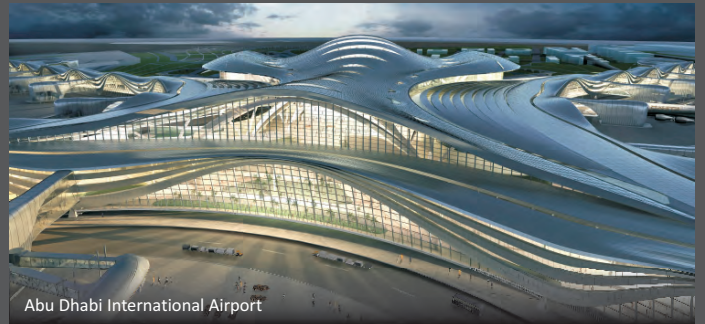
Abu Dhabi International Airport
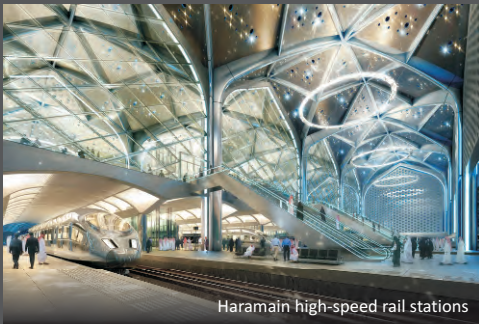
Haramain high-speed rail stations

King's Cross Western Concourse

Makkah Metro

Delmatic open protocol systems have been selected for major international transportation projects to ensure intelligent, secure and efficient management and monitoring of lighting.

The major interchange stations on Saudi Arabia's new **Haramain High Speed Rail** network incorporate roof lights and light tubes to maximise daylight. Delmatic systems within the stations adjust lighting based upon daylight and occupancy and sequence animated scenarios during the day: at night, dynamic scenes give the impression of stars in a night sky while precision rotation of projectors onto spherical chandeliers cascade diamonds of light onto the concourses and platforms.

Delmatic systems control lighting across the 9 stations of the **Makkah Metro** as well as within all 47 stations of the **Dubai Metro** which, at 74 km, is the longest driverless metro system in the world. Lighting modes and scenes activate according to daylight, occupancy patterns and calendar schedule, with manual override from touchpanels in every station control room and through the BMS network via an OCS SCADA interface.

King's Cross Station is one of the busiest transport hubs in London and a Delmatic system controls normal and emergency lighting throughout front-of-house and back-of-house areas, provides scene-setting of decorative concourse and façade lighting and real time monitoring via the station IP network.

Abu Dhabi International Airport new Midfield Terminal incorporates a total DALI solution and a Delmatic system manages and monitors normal and emergency lighting throughout the 700,000 sq.m building. Daylight and presence-related control optimise energy efficiency while real-time integration with airport scheduling systems links lighting precisely to flight arrivals and departures. Lighting is even used to assist passenger boarding with responsive dynamic animation sequences guiding passengers to departure gates.

smart homes

Delmatic have applied their expertise in DALI and control technology to smart home and guest room management systems, offering next generation controls with a stunning range of control devices

Delmatic Smart Home and Guest Room Management systems use innovative Dali single-bus technology to provide intelligent and efficient control of lighting and other services such as blinds, HVAC and audio across a shared network.

IP-based **smart home systems** control lighting and connected services from scene-set panels and mobile devices with master control from selected points and the master entrance panel.

Systems can be configured to varying levels of sophistication from entry-level solutions to the most advanced smart home networks. Systems are fully upgradeable via downloadable Apps or plug-ins, enabling residents to enhance their system with control of curtains and blinds, graphical multi-scene control via touchpanels, touchpads, phones and tablets, as well as integrate other services such as HVAC, audio and security.
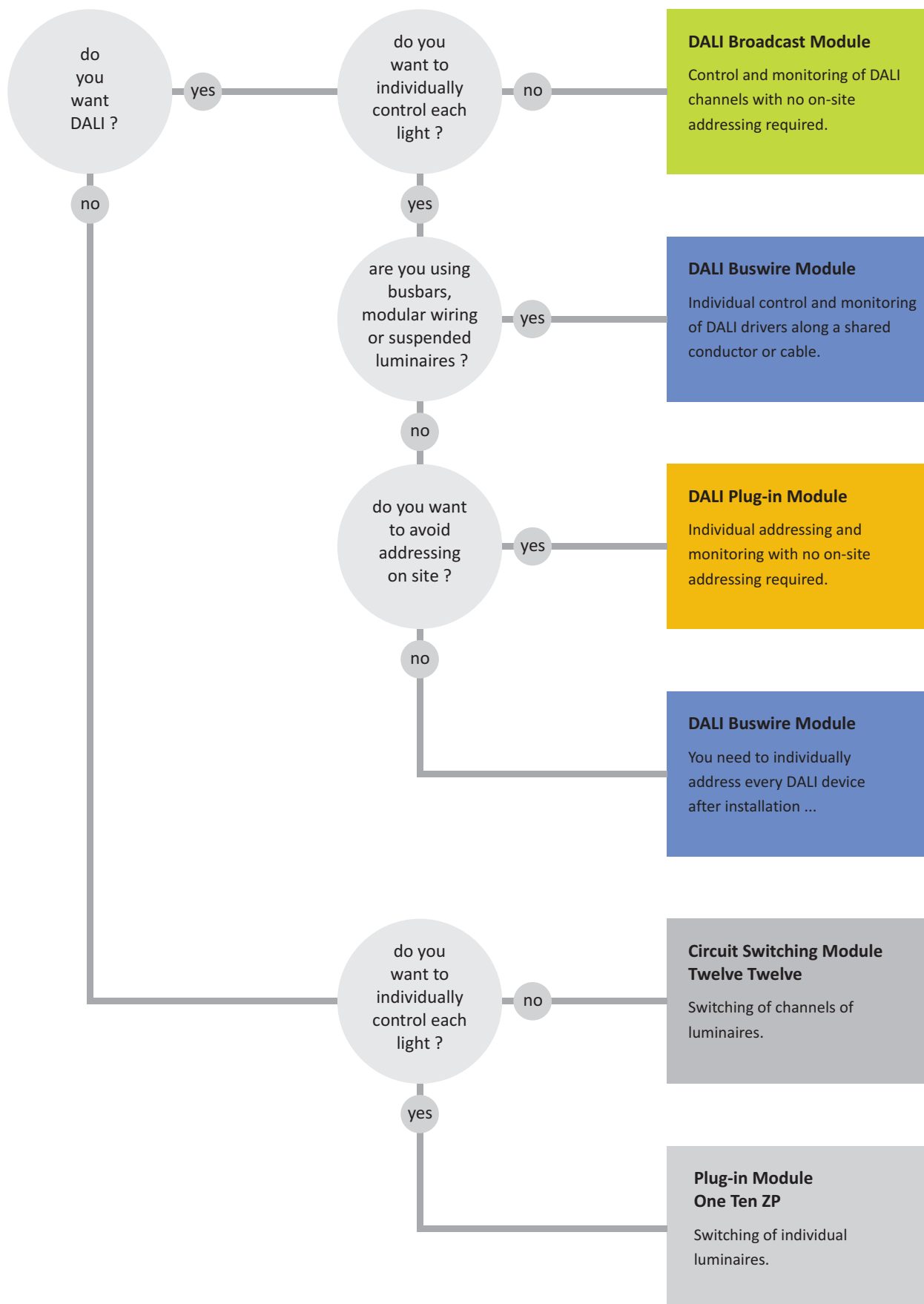
Smart sensors optimise efficiency and manage energy based upon occupancy, daylight and ambient temperature as well as initiating set-backs for lighting, power and HVAC during overnight and vacation periods.

Hotel guest room management systems combine powerful and intuitive user control for guests with efficient and reliable management and monitoring for operators.

Systems integrate with front office and room booking solutions to relate lighting scenes to room-lettings, even down to recalling preferred scenes for regular guests. Integration with guest entertainment, housekeeping and maintenance functions ensure convenience and comfort for guests coupled with powerful monitoring and management for operators.

WHICH TYPE OF MODULE DO YOU WANT ?

do you want DALI ?

yes

do you want to individually control each light ?

no

DALI Broadcast Module

Control and monitoring of DALI channels with no on-site addressing required.

yes

are you using busbars, modular wiring or suspended luminaires ?

yes

DALI Buswire Module

Individual control and monitoring of DALI drivers along a shared conductor or cable.

no

do you want to avoid addressing on site ?

yes

DALI Plug-in Module

Individual addressing and monitoring with no on-site addressing required.

no

DALI Buswire Module

You need to individually address every DALI device after installation ...

no

do you want to individually control each light ?

no

Circuit Switching Module Twelve Twelve

Switching of channels of luminaires.

yes

Plug-in Module One Ten ZP

Switching of individual luminaires.

Refer to www.delmatic.com for full technical data library and downloads

modules

DALI plug-in 36

DALI buswire 37

DALI broadcast 38

switching 39

ancillary controls 40

DALI One Ten ZP

DALI One Ten Five

DALI Zero Twelve

DALI Buswire One

DALI Buswire Three

DALI Buswire One ZP

DALI Broadcast

DALI Broadcast ZP

One Ten

Twelve Twelve

DALI One Relay

network

Lon router 42
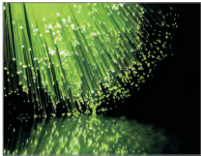
smart IP router 42

Lon Lon Router

Smart IP Router

DALI plug-in modules are smart hubs providing total flexibility and monitoring, rapid plug-in connectivity and out-of-the-box functionality without on-site addressing

- **smart hub for DALI fittings**
- **individual control and monitoring of each fitting**
- **total plug-in connectivity for speed and convenience**
- **open Lon and BacNET ISO communication**
- **optional WiFi communication**
- **individual DALI lamp and ballast failure**
- **individual DALI emergency light testing and monitoring**
- **pre-addressed DALI outputs**
- **no on-site addressing**

230V lighting circuit input from DB

10 x 230V switched outputs and
10 x pre-addressed DALI outputs to fittings

Lon / BACnet network buswire
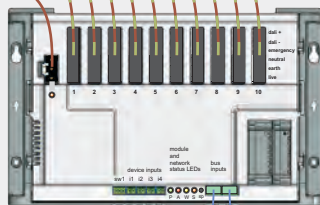
DALI Plug-in Module **One Ten ZP**

product 201B1

- 10 individual pre-addressed DALI outputs
- 10 individual switched 230V outputs (10A resistive, 3A inductive)
- 10A maximum loading
- 6-pin ports provide switched 230V & DALI pair to each fitting
- optimum energy efficiency with DALI Zero Power feature

dimensions (mm): 345 (w) x 210 (h) x 55 (d)

230V lighting circuit input from DB

10 x 230V outputs and
10 x pre-addressed DALI outputs to fittings

Lon / BACnet network buswire
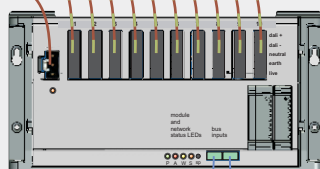
DALI Plug-in Module **One Ten Five**

product 211A1

- 10 individual pre-addressed DALI outputs
- 5-pin ports provide 230V & DALI pair to each fitting
- 10A maximum loading

dimensions (mm): 345 (w) x 180 (h) x 55 (d)

230V supply from DB

10 x pre-addressed DALI outputs to luminaires:
230V supply to luminaires wired direct from DB

Lon / BACnet network buswire

DALI Plug-in Module **Zero Twelve**

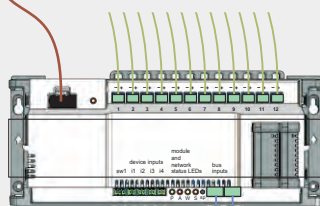product 206A1

- 12 individual pre-addressed DALI outputs
- 2-pin ports provide DALI pair to each fitting

dimensions (mm): 345 (w) x 155 (h) x 55 (d)

DALI buswire modules are smart digital routers providing total flexibility and monitoring of lighting and DALI devices along a shared bus

230V power supply

Lon/BACnet network buswire

DALI buswire to up to 64 drivers/ballasts/EmPros and up to 16 DALI devices (switches and sensors)

230V power supply

Lon/BACnet network buswire

DALI buswire 1
DALI buswire 2
DALI buswire 3

each DALI buswire connects to up to 64 drivers/ballasts/EmPros and 16 DALI devices

network run 1
mains cables to fittings and DALI buswire 1

network run 2
mains cables to fittings and DALI buswire 2

network run 3
mains cables to fittings and DALI buswire 3

home run
with mains cables from DB and Lon/BACnet buswire

each DALI network run connects to up to 64 drivers, ballasts, EmPros, and up to 16 DALI devices

- **smart digital router for DALI fittings**
- **individual control and monitoring of each fitting**
- **open Lon and BacNET ISO communication**
- **optional IP communication**
- **individual DALI lamp and ballast failure**
- **individual DALI emergency light testing and monitoring**

DALI operates at 24V ELV yet devices such as drivers sharing the buswire may only have functional isolation between mains and DALI. Therefore even through DALI operates at ELV, the installation should be treated as it if were operating at mains potential.
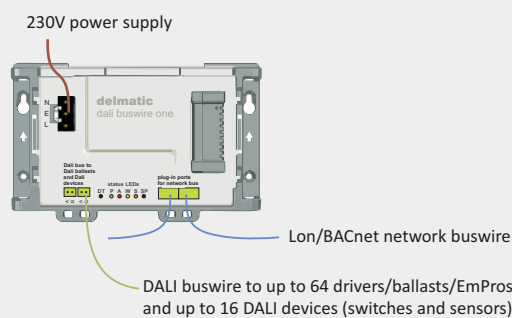
DALI Buswire One

product 205A1

- individual addressing and monitoring of 64 DALI ballasts/drivers
- individual monitoring of up to 16 DALI devices (sensors/switches)
- full DALI functionality via Lon and BACnet
- DALI Zero Power option - **Dali Buswire One ZP - 205Z1**

dimensions (mm): 225 (w) x 133 (h) x 66 (d)

DALI operates at 24V ELV yet devices such as drivers sharing the buswire may only have functional isolation between mains & DALI. Therefore the installation should be treated as it if were operating at mains potential.
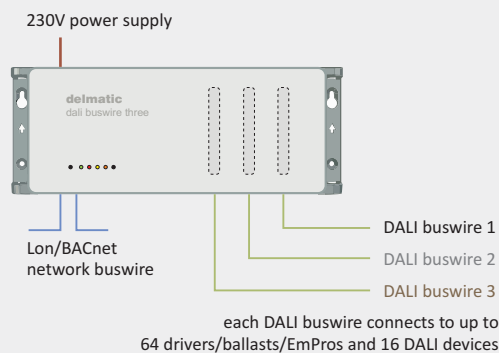
DALI Buswire Three

product 205T1

- individual addressing and monitoring of 192 DALI ballasts/drivers
- individual monitoring of up to 48 DALI devices (sensors/switches)
- full DALI functionality via Lon and BACnet

dimensions (mm): 335 (w) x 130 (h) x 140 (d)

DALI operates at 24V ELV yet devices such as drivers sharing the buswire may only have functional isolation between mains & DALI. Therefore the installation should be treated as it if were operating at mains potential.

DALI Buswire IMDB

product 205M1

- individual addressing and monitoring of 192 DALI ballasts/drivers
- individual monitoring of up to 48 DALI devices (sensors/switches)
- full DALI functionality via Lon and BACnet
- forms part of modular wiring installation and network

dimensions (mm): 350 (w) x 350 (h) x 140 (d)

DALI operates at 24V ELV yet devices such as drivers sharing the buswire may only have functional isolation between mains & DALI. Therefore the installation should be treated as it if were operating at mains potential.
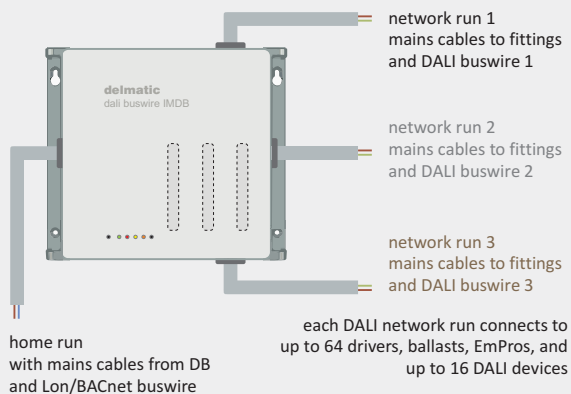
DALI broadcast modules are powerful hubs providing control and monitoring of DALI channels across a large area without on-site addressing

- **smart hub for DALI fittings**
- **control and monitoring of DALI channels**
- **open Lon and BacNET ISO communication**
- **optional WiFi communication**
- **channel DALI lamp and ballast failure**
- **individual DALI emergency light testing and monitoring**
- **DALI sensors and switches connect direct to DALI channel**
- **pre-addressed DALI outputs**
- **no on-site addressing**

230V power supply

Each DALI channel connects to up to 40 DALI drivers/ballasts, EmPros plus DALI devices

Lon/BACnet network buswire

DALI channel 1
DALI channel 2
DALI channel 3
DALI channel 4
. . .
DALI channel 10
DALI channel 11
DALI channel 12

DALI Broadcast Module
product 204A1

- 12 individually addressed DALI channels
- up to 480 DALI lamps controlled across twelve DALI channels
- full DALI functionality via Lon and BACnet

dimensions (mm): 330 (w) x 190 (h) x 70 (d)

DALI operates at 24V ELV yet devices such as drivers sharing the buswire may only have functional isolation between mains & DALI. Therefore the installation should be treated as it if were operating at mains potential.

Up to 12 single or three-phase lighting circuits from DB

ZP channel 1
ZP channel 2
ZP channel 3
. . .
ZP channel 11
ZP channel 12

Each switched ZP channel controls up to 20A

12 independent DALI channels each connecting to up to 40 drivers/ballasts plus DALI devices

smart network to switches and sensors

Lon/BACnet network buswire

DALI Broadcast ZP Module
product 202Z1

- 12 individually addressed DALI channels
- up to 480 DALI lamps controlled across twelve DALI channels
- full DALI functionality via Lon and BACnet
- 12 individually switched Zero Power channels (20A per output)
- accepts up to twelve incoming circuits (single or three phase)
- equipped with twelve mechanically latched relays
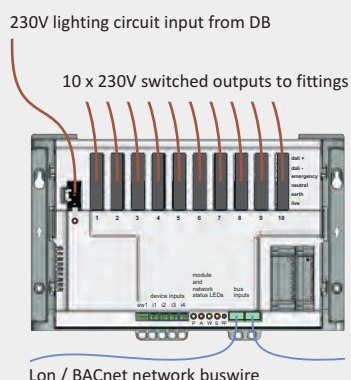- fascia override switch and status for each relay output

dimensions (mm): 330 (w) x 380 (h) x 70 (d)

DALI operates at 24V ELV yet devices such as drivers sharing the buswire may only have functional isolation between mains & DALI. Therefore the installation should be treated as it if were operating at mains potential.
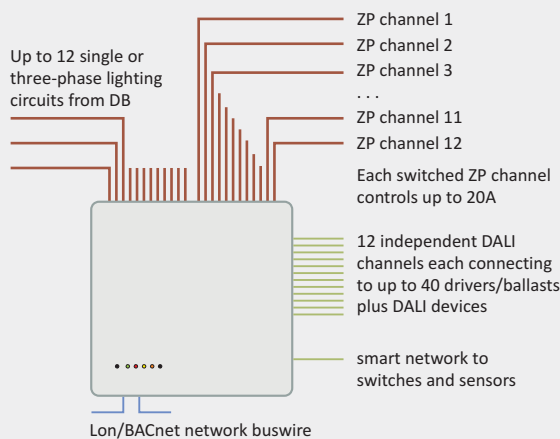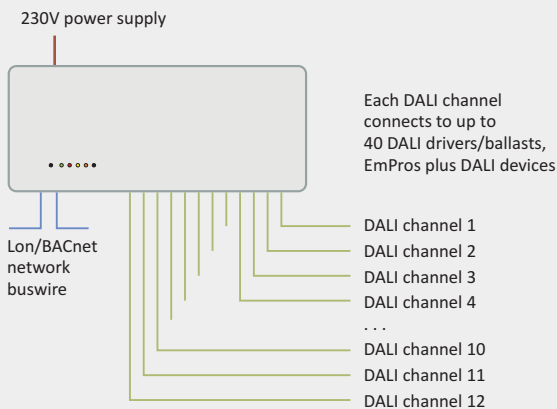
Switching modules are smart units providing a range of flexibility from individual fitting to circuit control

- smart modules for switching fittings
- range of flexibility from individual fittings to circuit control
- open Lon and BacNET ISO communication
- pre-addressed outputs
- no on-site addressing
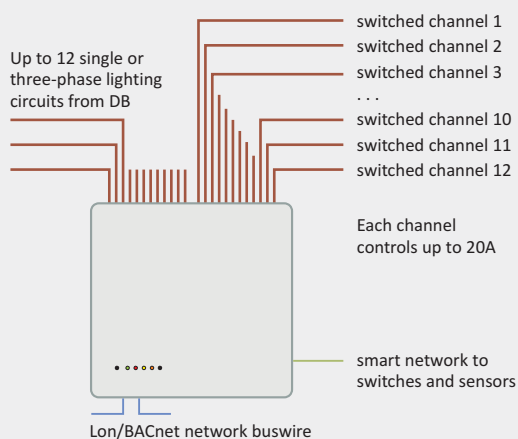- fully upgradeable to include dimming operation

230V lighting circuit input from DB

10 x 230V switched outputs to fittings

Lon / BACnet network buswire

Plug-in Module One Ten

product 201A1

- 10 individual switched 230V outputs (10A resistive, 3A inductive)
- 10A maximum loading
- 6-pin ports provide switched 230V to each fitting
- total plug-in connectivity for speed and convenience
- plug-in upgrade to DALI operation with DALI Zero Power feature

dimensions (mm): 345 (w) x 210 (h) x 55 (d)

Up to 12 single or three-phase lighting circuits from DB

switched channel 1
switched channel 2
switched channel 3
. . .
switched channel 10
switched channel 11
switched channel 12

Each channel controls up to 20A

smart network to switches and sensors

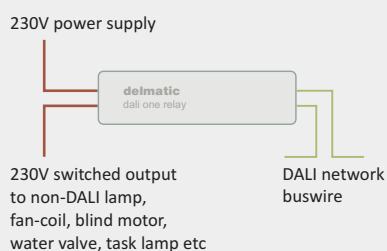Lon/BACnet network buswire

Circuit Switching Module Twelve Twelve

product 202A1

- 12 individual switched output channels (20A per output)
- accepts up to twelve incoming circuits (single or three phase)
- equipped with twelve mechanically latched relays
- fascia override switch and status for each relay output
- fully factory-assembled unit
- accepts plug-in upgrade for 1-10V or DALI dimming

dimensions (mm): 330 (w) x 380 (h) x 70 (d)

230V power supply

delmatic
dali one relay

230V switched output to non-DALI lamp, fan-coil, blind motor, water valve, task lamp etc

DALI network buswire

DALI One Relay

product 208A1

- intelligent DALI relay controls non-Dali lamps and other devices such as fan-coils, blinds, water valves etc within a Dali environment
- connects direct to shared DALI buswire
- 5A (inductive) mechanically-latched relay
- full DALI switching functionality via Lon and BACnet

dimensions (mm): 245 (w) x 30 (h) x 30 (d)

Ancillary controls extend the scope of the lighting management system to encompass other devices and services using lighting control modules and hardware.

- **enhanced efficiency through integrated control**
- **assist in achieving higher BREEAM and LEED ratings**
- **open Lon and BacNET ISO communication**

Water management

The lighting management system controls lighting in toilets and washrooms based upon presence or absence.

The same presence detectors can operate outputs from control modules or DALI relays controlling water valves (flow devices) so that use of water is regulated and linked to occupation and is not wasted when areas are not in use.

Task light and power socket management

The lighting management system controls lighting throughout a building yet valuable additional savings can be achieved by controlling individual task lighting and power sockets.

System presence detectors can operate task lighting (as well as power sockets) based upon occupation of an area while individual sensors associated with each workstation can provide a finer degree of control.

Control of non-DALI sources

The lighting management system incorporates a variety of control modules, and relays within the modules or dedicated DALI relays can be used to control non-DALI light sources and other services as part of an integrated DALI solution.
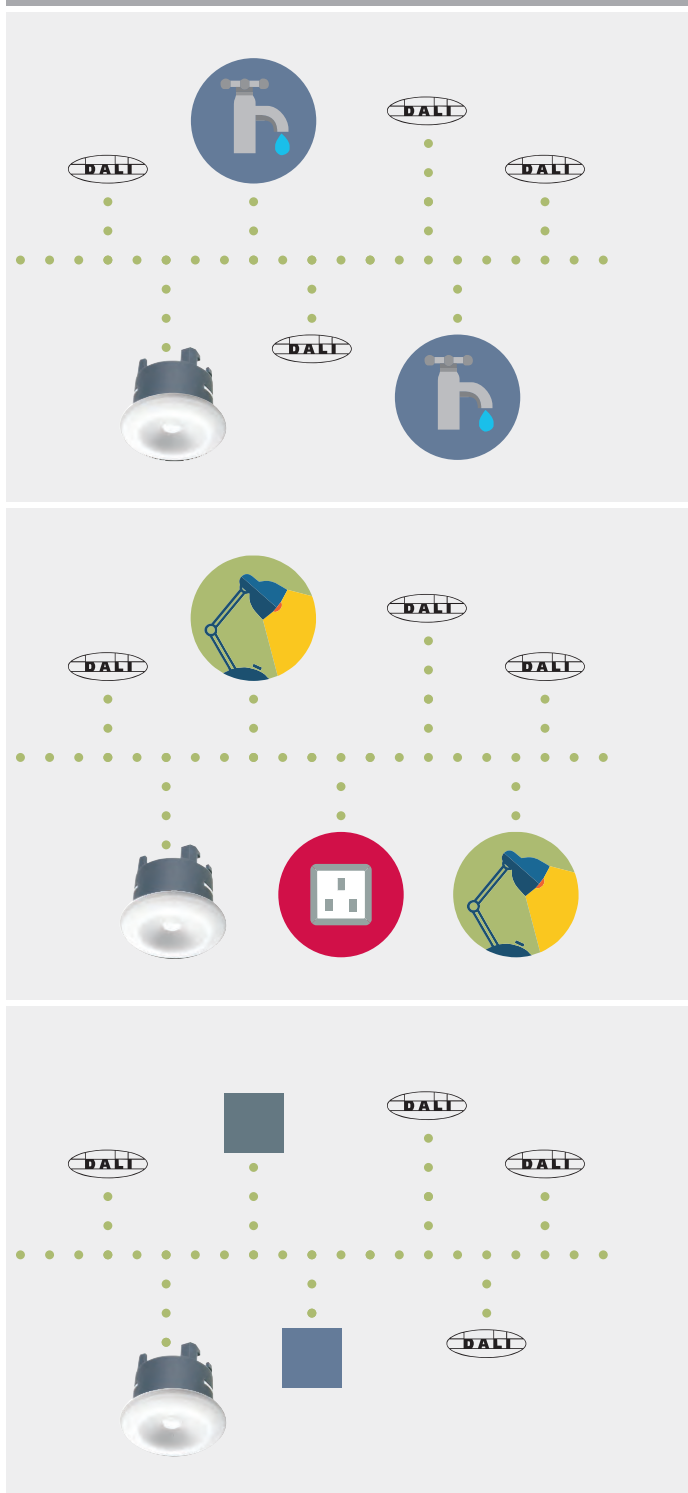
Refer to www.delmatic.com for full technical data library and downloads

local control devices

sensors

43

DALI Presence Detector

DALI Multisensor

DALI Microwave sensor

scene-set panels

44

DALI Scene-Set panel (5+)

DALI Scene-Set panel (10+)

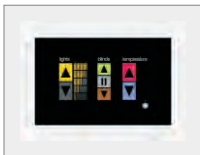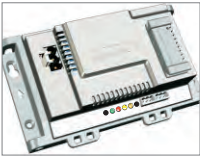**touch panels**

45

Touchpanel

Touchpad

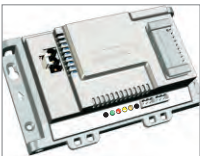**Apps, VOIP & IP**

46

Apps

IP phone control

Web browser control
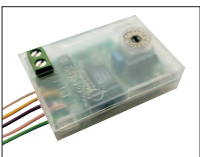
interfaces

RS 232

47

Rs232 interface

DMX

47

DMX interface

DALI switch interface

47

DALI switch interface

Routers form the backbone of the system architecture and optimise transmission of data across the building network

- **smart routers optimise data routing and transmission**
- **seamlessly connect vertical and horizontal networks**
- **integral code-protected master control overrides**
- **monitoring and global control via WiFI devices**
- **open Lon and BACnet ISO communication**
- **accept digital inputs for direct commands from other systems**
- **integral network termination resistors**

230V power supply

delmatic
Lon Lon Router

Lon buswire
to Routers
on site-wide
(vertical)
network

digital inputs
and outputs
from/to other
systems or devices

Lon buswire to
modules and devices
(horizontal network)

Lon Lon Router
product 106D1

- master command functions for e-test, load shed, global on/off
- real-time signal and comms monitoring
- supports up to 60 lighting control modules
- three digital inputs plus four digital outputs
- ANSI/EIA 709.1-A-1999 (LonTalk protocol) interface
- 500m maximum network cable length (free topology)
- 1500m maximum network cable length (bus topology)

dimensions (mm): 380 (w) x 150 (h) x 70 (d)

230V power supply

delmatic
Smart IP Router

IP connection
from building
IP/IT (vertical)
network

digital inputs
and outputs
from/to other
systems or devices

Lon buswire to
modules and devices
(horizontal network)

## Smart IP Router
product 106S2

- routes data across the shared building IT/ IP network
- connects Lon devices to IP based applications
- built-in drivers for Lon, LNS RNI, Modbus, M-Bus, and SOAP/XML
- configured by Delmatic Lightscape software or on-board web pages
- master command functions for e-test, load shed, global on/off
- real-time signal, Ethernet and comms monitoring
- supports up to 60 lighting control modules
- three digital inputs plus four digital outputs
- ISO/IEC 14908-4 (IP-852) routing of Lon over IP network
- 10/100BaseT, auto-selecting, auto polarity
- 500m maximum network cable length (free topology)
- 1500m maximum network cable length (bus topology)

dimensions (mm): 380 (w) x 150 (h) x 70 (d)

LON

ASHRAE BACnet

Smart BACnet software
product 106SB1

- upgrades Smart IP Router into a powerful Lon BACnet gateway
- read/write abilities for up to 1000 Lon/BACnet data point
- acts as BACnet Server with read/write access from BACnet clients
- includes BACnet browser, discovery and configuration tool
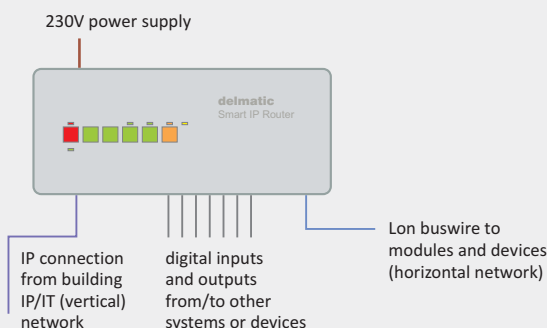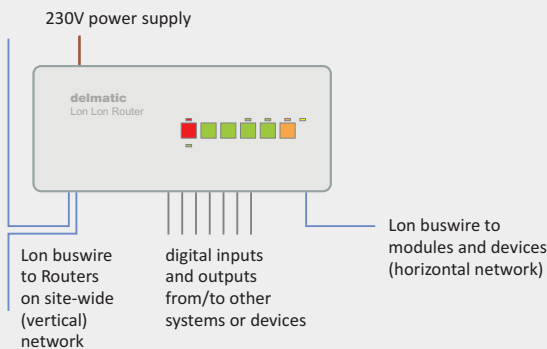
sensors maximise energy-efficiency by relating lighting to occupation and daylight

the compact devices simply tap into the Dali network for ease and speed of installation

available with white body suffix: W

available with black lens suffix: B

- **intelligent, adaptive presence and daylight detection**
- **open DALI communication**
- **software configurable for presence or absence detection**
- **software configurable time-out and daylight sensitivity**
- **multi-step dim-to-off options**
- **enhanced absence detection presence extension mode**
- **enhanced absence detection darkness mode**
- **ultra-compact low-profile design**
- **integrated signal and function LED**

DALI PIR Presence / Absence detector
product 163B1

- intelligent PIR sensor with signal detection analysis
- high resolution and sensitivity
- software-configurable presence or absence mode and time-out
- software-configurable optimised behaviours for defined areas
- infra-red interface for local control of lights and other services
- no DALI addresses occupied
- connects to module or direct onto Dali buswire
- detection range - 6m diameter at 2.5m mounting height

dimensions - depth: 35 mm
        - bezel diameter: 49 mm.
        - cut-out diameter: 40 mm

DALI Multisensor
product 164B1

Multisensors optimise efficiency by linking lights to occupancy and daylight: additional features include:

- integrated adaptive daylight sensor
- software-configurable default illumination levels
- software-configurable photocell bands and sensitivity thresholds
- receives temperature and set-point for integrated HVAC control

### DALI Microwave Multisensor
product 166M1

- intelligent detection over an extended area
- highly sensitive detector emits low power microwave signals
- no DALI addresses occupied
- detection range - 30m length by 6m width (maximum sensitivity)
- mounts to UK standard single-gang 40mm depth flush box
- supplied with interchangeable square and round clip-on fascias

dimensions - depth: in front of wall: 20 mm. behind wall: 25 mm
        - fascia: round: 125 mm (dia); square 100 x 100 mm

round   square

scene set panels provide control of lighting scenes and integrated functions including blinds and AV equipment

- scene setting of lighting, integrated blinds and AV
- adaptive switch controls all types of dimming technology
- open DALI communication
- five or ten scenes, global raise / lower and active status
- scenes are fully configurable through graphical software
- connects direct to the DALI buswire to reduce wiring
- contemporary design with screwless stainless steel fascia
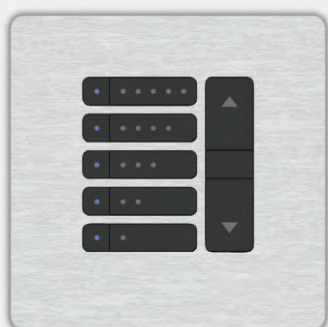
DALI Scene Set panel - five scenes with global adjust
product 123C2

- five scenes with active scene status
- global raise / lower function for each scene
- integral IR receiver for remote selection of scenes

DALI Scene Set panel - five scenes with global adjust
product 123D1

- five scenes with active scene status
- global raise / lower function for each scene
- integral IR receiver for remote selection of scenes
- space to fit third party AV or temperature controls

DALI Scene Set panel - ten scenes
product 123D2

- ten scenes with active scene status

DALI Scene Set panel - ten scenes with global adjust
product 123D3

- ten scenes with active scene status
- global raise / lower function for each scene
- integral IR receiver for remote selection of scenes

DALI Scene Set panel - five scene, global adjust & blind control
product 123D4

- ten scenes with active scene status
- global raise / lower function for each scene
- raise / lower functions for window blind and shade control
- integral IR receiver for remote selection of scenes

Delmatic's latest touch devices deliver the ultimate touchscreen looks and experience

- **precision-engineered from aluminium and glass**
- **optically-bonded screen with high-resolution graphics**
- **open protocol communication via DALI, Lon or IP**
- **controls lighting, blinds, AV, HVAC and other services**
- **animated graphics provide powerful, intuitive control**
- **comprehensive dashboard and monitoring functions**
- **integrated thermostat for room temperature monitoring**

Touchpanel
product 231A1

- ultra-cool touchpanel appears to float on the wall
- scalable control of a single room, apartment or entire building
- integrated scene-setting and control
- graphical management and monitoring of complete system
- 7" TFT touchpanel
- high-resolution 800 x 480 graphics
- fully software configurable with images, animation and logos
- multiple sub-menus with individual options and preferences
- users can flip instantly between functions and services

bezel dimensions (mm) 202 (w) x 160 (h) x 12 (d) + 3 mm float
mounts onto standard two-gang back-box

Touchpad
product 231B1

- contemporary desktop device
- scalable control for single room to entire building
- integrated scene-setting and control
- 7" TFT touchpanel
- high-resolution 800 x 480 graphics
- fully software configurable with images, animation and logos
- multiple sub-menus with individual options and preferences
- users can flip instantly between functions and services
- wireless IR communication

dimensions (mm) 202 (w) x 175 (d) x 45 (h)

Apps, IP and web browser control enable users to manage and adjust lighting to suit their personal preferences using mobile and office devices

- **smart, wireless user control of lighting**
- **personal control from personal devices**
- **control of lighting and other connected services including temperature, smart glass, blinds, AV etc**

IOS and Android APPs control

- native apps allows users to adjust lighting levels and scenes
- individual or group control based on user access rights
- full dimming range available from mobile device
- mobile device acts as controller for presentations and meetings
- integrated QR codes for location based actions

IP phone control
product 126B1

- IP phone allows users to launch lighting control application
- individual, group or master control based on access rights
- VOIP desk phone becomes office user personal control
- keypad or touchscreen lighting and scene control
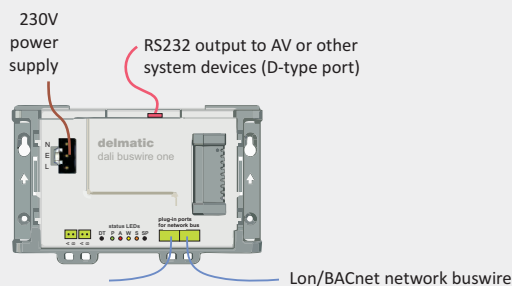- security, cleaning and maintenance function options

Web browser control
product 138A1

- web browser software launches lighting control application
- desktop function buttons and slider bars for
  - on/off control (with dim to off function)
  - raise and lower control
  - scene-set and preferred level controls
- integrates with PC to dim lighting when screen saver active
- integrates with PC to turn lights off after PC turned off

Interface modules seamlessly integrate other systems and protocols with the lighting management network

- **smart interfaces**
- **integrate other protocols and devices onto system**
- **open Lon and BacNET ISO communication**

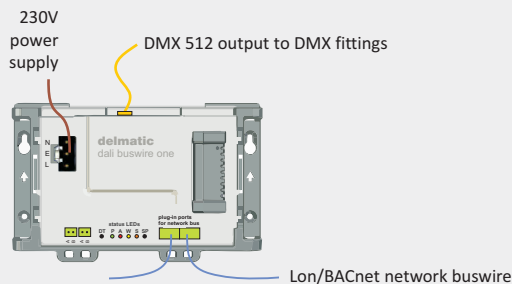## RS232 Interface

product 215A1

- receives and transmits RS232 data
- integrates control of lighting and AV functions
- activates lighting scenes based upon commands from AV system
- triggers AV functions based upon selected scenes
- fully software configurable for scenes, data format etc

dimensions (mm): 225 (w) x 133 (h) x 66 (d)

DMX Interface

product 216A1

- transmits DMX 512 data to DMX light sources and devices
- integrates control of DMX fittings into site-wide syste
- activates DMX scenes and routines from any system device
- fully software configurable for data format etc

dimensions (mm): 225 (w) x 133 (h) x 66 (d)
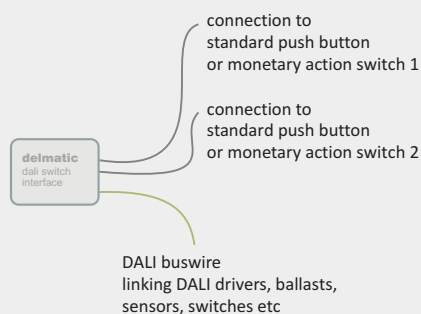
DALI switch interface

product 119A1

- converts standard switches into intelligent DALI system switches
- enables DALI switches to match finish of other accessories
- provides independent operation for two switches and functions
- connects direct to the DALI buswire to reduce wiring
- compact unit fits within switch backbox

dimensions (mm): 46 x 32 x 14 (d)

DALI operates at 24V ELV yet devices such as drivers sharing the buswire may only have functional isolation between mains & DALI. Therefore the installation should be treated as it if were operating at mains potential.

To ensure reliable operation of the lighting management system and peripherals it is important to use the specified cables or their approved equivalents.

Conductor:	stranded twisted copper wire
AWG:	2 x 20 awg
Colour code:	black / white
Temperature range:	-20 to *90 degrees centigrade
Voltage rating:	600 volts
Fire performance:	IEC60332-1, IEC60332-3, IEC61034, IEC60754-1, IEC60092
Nominal diameter (mm):	4.57
Weight (kg/km):	21
Conductor DC resistance:	33 ohm/km (nominal)
Nominal inductance:	0.56µH/m

Lon and BACnet

up to 1000 metres   **Twisted pair Firefighter 4001P2044-BW-20AWG**

Conductor:	stranded twisted copper wire
AWG:	2 x 14 awg
Colour code:	black / white
Temperature range:	-20 to *90 degrees centigrade
Voltage rating:	600 volts
Fire performance:	IEC60332-1, IEC60332-3, IEC61034, IEC60754-1, IEC60092
Nominal diameter (mm):	8.64
Weight (kg/km):	96
Conductor DC resistance:	9.38 ohm/km (nominal)
Nominal inductance:	0.56µH/m

DALI

maximum 300 metres   **Twisted pair Firefighter 4001P1444-14AWG**

A lighting management system is not like a laptop or mobile phone which you expect to replace every so often to keep up to date with technology. And yet you still want the system to stay in full working order, remain up-to-date and, most of all, allow enhancement and upgrades in the future.

Delmatic systems do for hardware what Apps do for software.

Delmatic's modular components mean systems can be upgraded from one generation of technology to another by uploading new software or replacing plug-in devices – all without any changes to the installation or wiring.

future proofing

BT Brentwood

British Telecom's Brentford offices, constructed in 2000, were designed to be environmentally and user-friendly, and have often been used for piloting the latest flexible working techniques within the corporation.

The original Delmatic system has, similarly, been refreshed and enhanced under a rolling programme with modules upgraded as part of night-time maintenance works, retaining original cabling and network infrastructure to maximise sustainability and reuse.

Devonshire Square

Devonshire Square dates back to the mid 1700s, and the Grade II listed warehouses which once stored exotic goods from around the world have been transformed into a multi-use campus environment.

The Delmatic systems installed within the project demonstrate the same versatility for use and reuse as the buildings themselves.

Systems installed in the early 1990s have been upgraded to latest open platform technology bringing the advantages of open protocol Lon, BACnet and Dali technology to networks first installed more than twenty years ago.

99 Bishopsgate

99 Bishopsgate is a landmark tower in the heart of the City of London.

Redeveloped in 1996, the 26 floors were equipped with a Delmatic system, while subsequent building refurbishments in 2006 and 2012 also implemented upgrades to the modular system.

The first upgrade swapped the original proprietary control cards for latest open protocol Lon cards, transforming the system into open platform technology.

More recent upgrades have introduced Lon and BACnet integration as well as DALI dimming and monitoring as luminaires have been replaced.

project management

Effective project management is essential to success.

Delmatic coordinate every stage of a project and, in partnership with major electrical and main contractors, have developed a comprehensive 22 stage management process which guides a project from design, through delivery, liaison with the installing contractor and culminates in final commissioning, training and successful handover.

Dedicated project teams plan and coordinate each project through to final completion - deploying resources, scheduling deliveries, developing technical submissions and descriptions of operations, preparing commissioning programmes, issuing documentation and arranging training, as well as continually monitoring progress.

Delmatic expedite programming and commissioning by carrying out all configuration works off-site with specialist in-house project teams creating databases, graphics and operational scenarios.

Intelligent hardware identifies installation issues in real time while active monitoring enables engineers to remotely validate hardware and network connectivity.

To guarantee technical competence at the highest level, Delmatic maintain a team of full-time, certified engineers who carry out complete on-site system commissioning. working with the contractor to deliver a fully operational system.

	Delmatic Project Management Process		
	Delmatic scope off-site	**Delmatic scope on-site**	**Contractor scope**
01	Delmatic hold **Project Handover Meeting**		
02	Delmatic convene **Project Pre-Installation Meeting** with contractor on site		
03	Delmatic issue **Project Pack**		
04	Delmatic issue **Project Installation Drawings**		
05	Delmatic issue **Project Zoning Drawings**		
06	Delmatic issue **Project Des of Ops**		
07	Delmatic prepare **Project database/graphics**		
08			Contractor installs system in benchmark area
09	Delmatic issue **Pre-Commissioning Checklist**		
10			Contractor verifies installation against **Pre-Commissioning Checklist**
11		Delmatic configure and test system in benchmark area and review with contractor	
12	Delmatic issue **Project Benchmark Document**		
13	**Off-site witnessing** of project graphics		
14			Contractor completes system installation
15			Contractor verifies installation against Project Benchmark Document
16			Contractor releases areas for commissioning
17		Delmatic address Dali ballasts on site (if relevant)	
18		Delmatic upload database and graphics on site and test installed system	
19	Delmatic issue **Commissioning Documents**		
20	Contractor and Delmatic hand over system to consultant/client		
21	Delmatic train client / FM staff		
22	Warranty support, after-sales support, on-line system monitoring and real-time optimisation		

Delmatic projects are typically awarded **excellent** and **outstanding** assessment ratings

The Carmine Building: BREEAM **excellent**

LSE Saw Swee Hock Centre: BREEAM **outstanding**

Building Regs

Building Regs Part L are designed to enhance sustainability, improve the use of low-carbon fuels and reduce greenhouse gas emissions, and set out fundamental requirements which must, by law, be met when designing a project.

The regulations are not only about improving energy efficiency but also about understanding where energy goes in a building and taking steps to monitor and reduce this.

Delmatic lighting management systems address all the requirements of Part L through the provision of manual control, presence and absence detection, daylight-linking, as well as energy metering and monitoring.

BREEAM and LEED

Environmental assessment schemes such as BREEAM, LEED and ESTIDAMA set the standards for best practice in sustainable design and development and allow owners, users and designers of buildings to review and improve environmental performance throughout the life of a building.

The schemes set criteria surpassing those required by law and encourage innovation to minimise the environmental impact of buildings and recognise low impact buildings.

Delmatic systems offer outstanding energy and operational efficiency and, by assisting in sustainable building design, enable the achievement of high scores and ratings.

Systems gain credits across the assessment categories addressing issues such as light pollution reduction, managing lighting, daylighting and glare, presence-related control of scarce resources including energy & water, monitoring and reporting, minimising waste through longevity of life and re-use, as well as continuous innovation in design.

what's new?   what's trending?   how do I … ?

CPDs - sharing knowledge

If you want to design the most advanced and efficient systems for a project, you need to know what technology is out there and also what is in the pipeline for the future.

Delmatic are at the cutting-edge of controls technologies and we have our finger very much on the pulse regarding the latest controls, networks, lighting and integrated services.

Our experience is available as a resource to project consultants and designers through a series of CPD seminars and webinars covering a range of topics from general overviews of lighting management to specialist seminars providing in-depth studies of topics such as DALI, Building Regs, BREEAM and LEED.
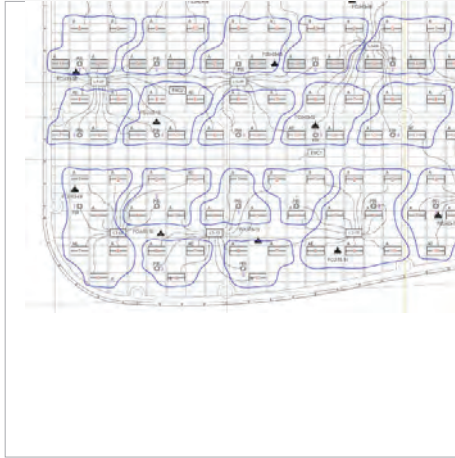
The CPD courses, which have been assessed against best practice guidelines, are accredited by CIBSE and count towards an individual's CPD requirement.

For more details on CPD sessions, visit **www.delmatic.com/cpd**, email **cpd@delmatic.com** or phone **020 3184 2000**.
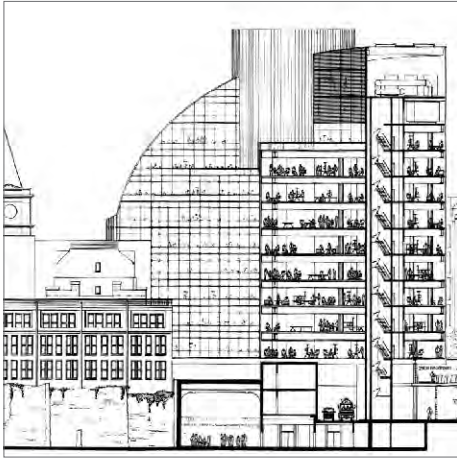
from the earliest days of concept design ...

through detailed design and application ...

to handover of the completed network solution

technical **support**

Delmatic offer a comprehensive advisory and design service to consultants interested in the application of advanced lighting management and energy optimisation systems.

Our experience in supplying systems over more than fifty years coupled with detailed knowledge of current and emerging technologies enables Delmatic to give unique insight on the best-practice application of systems.

Our involvement starts from the earliest days of a project, working with the design team to understand the requirements of the building and develop a solution that precisely suits the individual project.

We assist in the development of scheme & concept designs, project-specific schematics, BIM objects, hardware application and layouts and the preparation of system specifications. We subsequently liaise with tendering and installing contractors, produce porting and zoning drawings, detailed Descriptions of Operations, testing and commissioning schedules, culminating in handing-over a fully operational system to trained client personnel.
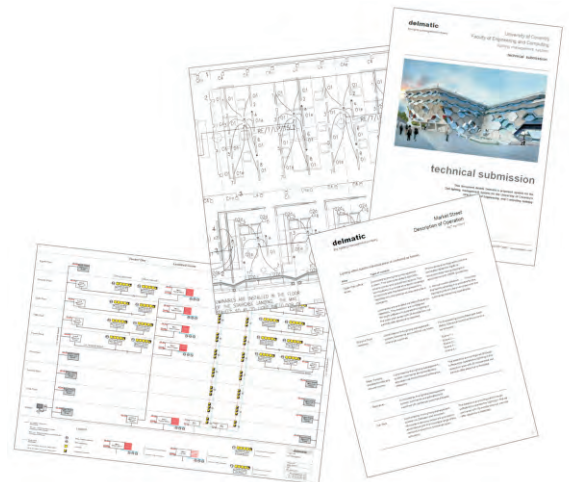
The growing trend towards connected and networked buildings design means that lighting, air-conditioning, solar shading & security systems increasingly work together, and Delmatic are able to advise and assist in the optimum design and application of open-protocol and open platform integrated solutions.

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delmatic.com

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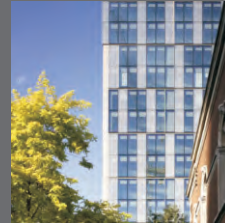
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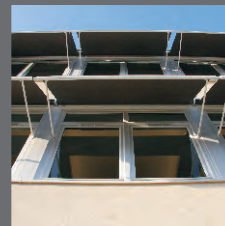
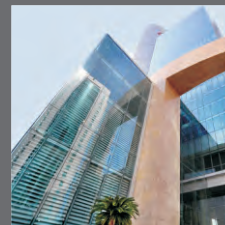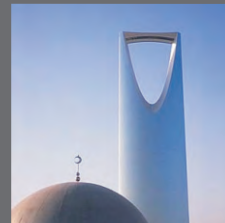## Qatar

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