



lighting management
technical guide

edition 13

delmatic

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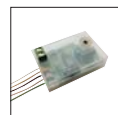
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delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

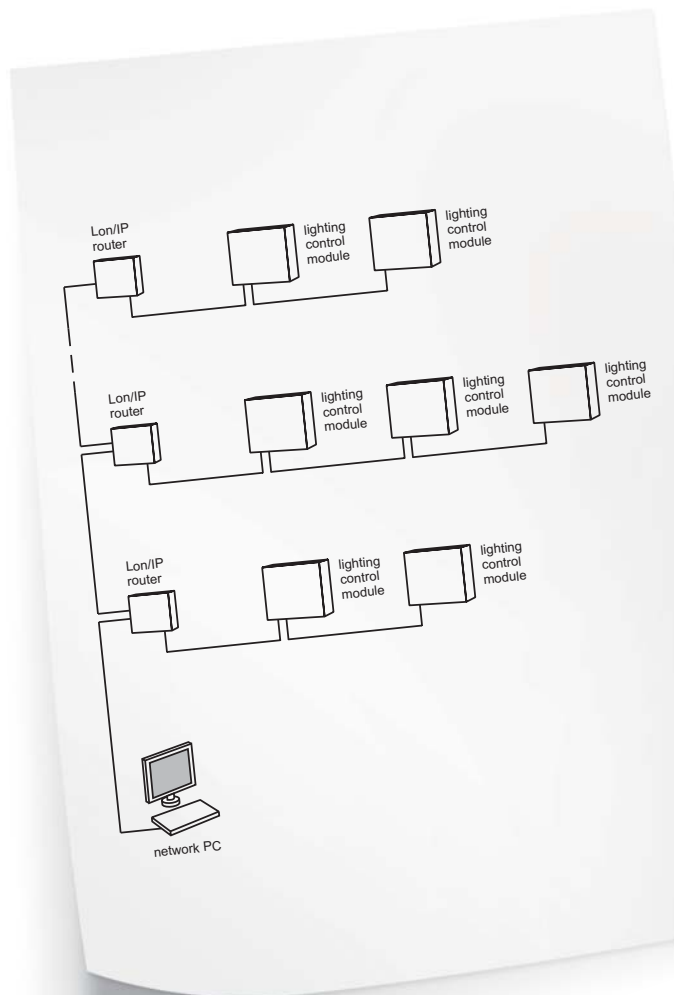
Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
sales@delmaticsaudi.com

Delmatic lighting management systems transform rigid, physical installations into virtual networks, configured, managed and monitored through powerful graphical software.

This **technical guide** contains data sheets on all main items of equipment and incorporates a comprehensive **design section** detailing how to apply a system based upon the degree of flexibility, type of control, and method of installation.



quick selection guide page 4

quickly finds the module that suits your control, flexibility & installation requirements

typical schematic page 6

illustrates how the various modules connect to form an integrated network

dali application guide page 8

explains the ways to optimise Dali flexibility while minimising or avoiding addressing

switching application guide page 10

outlines the approaches to switching controls

system applications page 12

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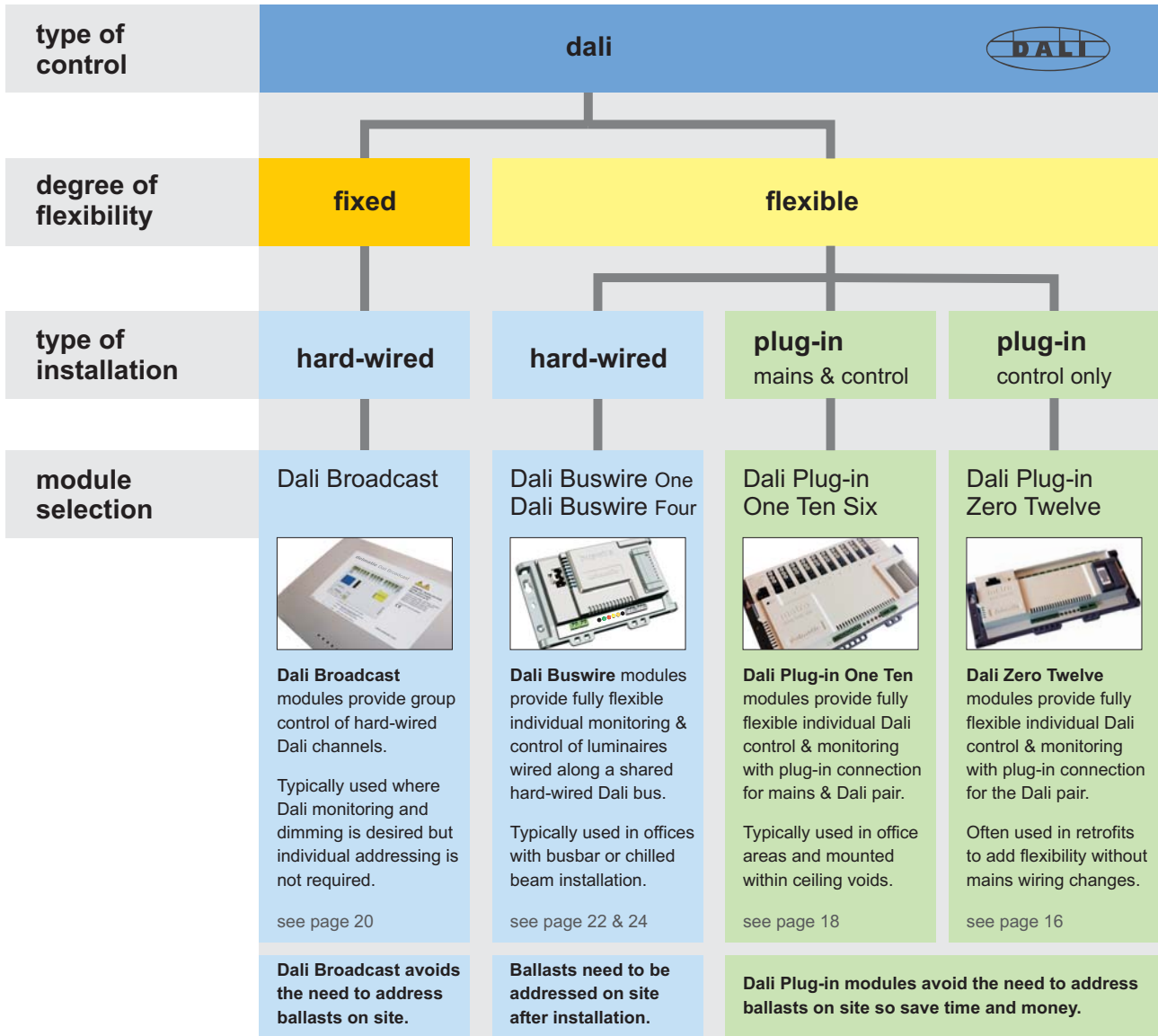
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delmatic - quick selection guide

The **delmatic** range includes modules to control every type of light source and provide every degree of flexibility.

The selection of the appropriate module is based upon:

- type of control** Dali, switching or other forms of dimming
- degree of flexibility** flexible or fixed control
- type of installation** plug-in or hardwired



fixed control

lighting arrangements in fixed areas such as cores, stairs, toilets and lobbies, will not change. **fixed control** switches or dims a hard-wired group of luminaires as a single entity which cannot be split into smaller groups.

flexible control

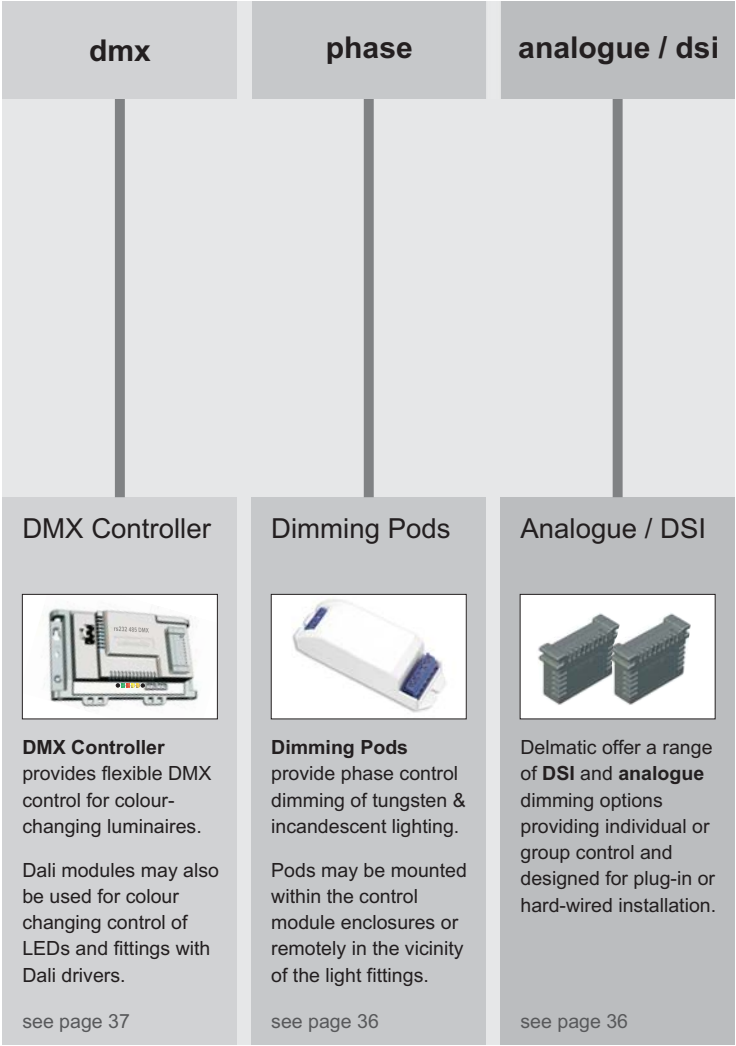
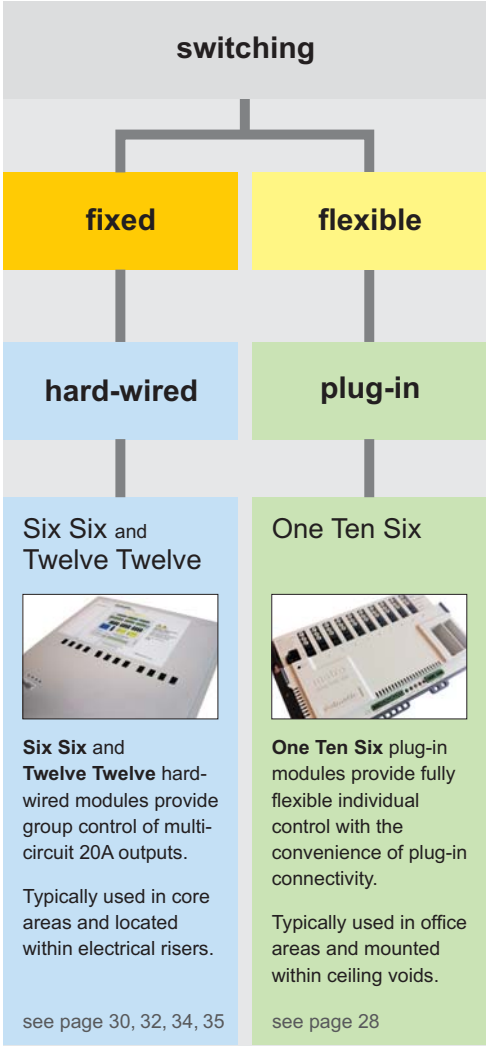
lighting arrangements in areas such as offices require a high degree of flexibility to allow for changes during the life of the project. **flexible control** addresses each luminaire so groupings can be adapted through software.

hard-wired installation

uses modules with terminals for the hard-wired connection of cables: with a Dali Buswire module, the hard-wired bus still provides total flexibility of control.

plug-in installation

uses modules with sockets for the plug-in connection of luminaire flexes achieving fast and simple installation and, for Dali projects, no addressing of Dali ballasts.



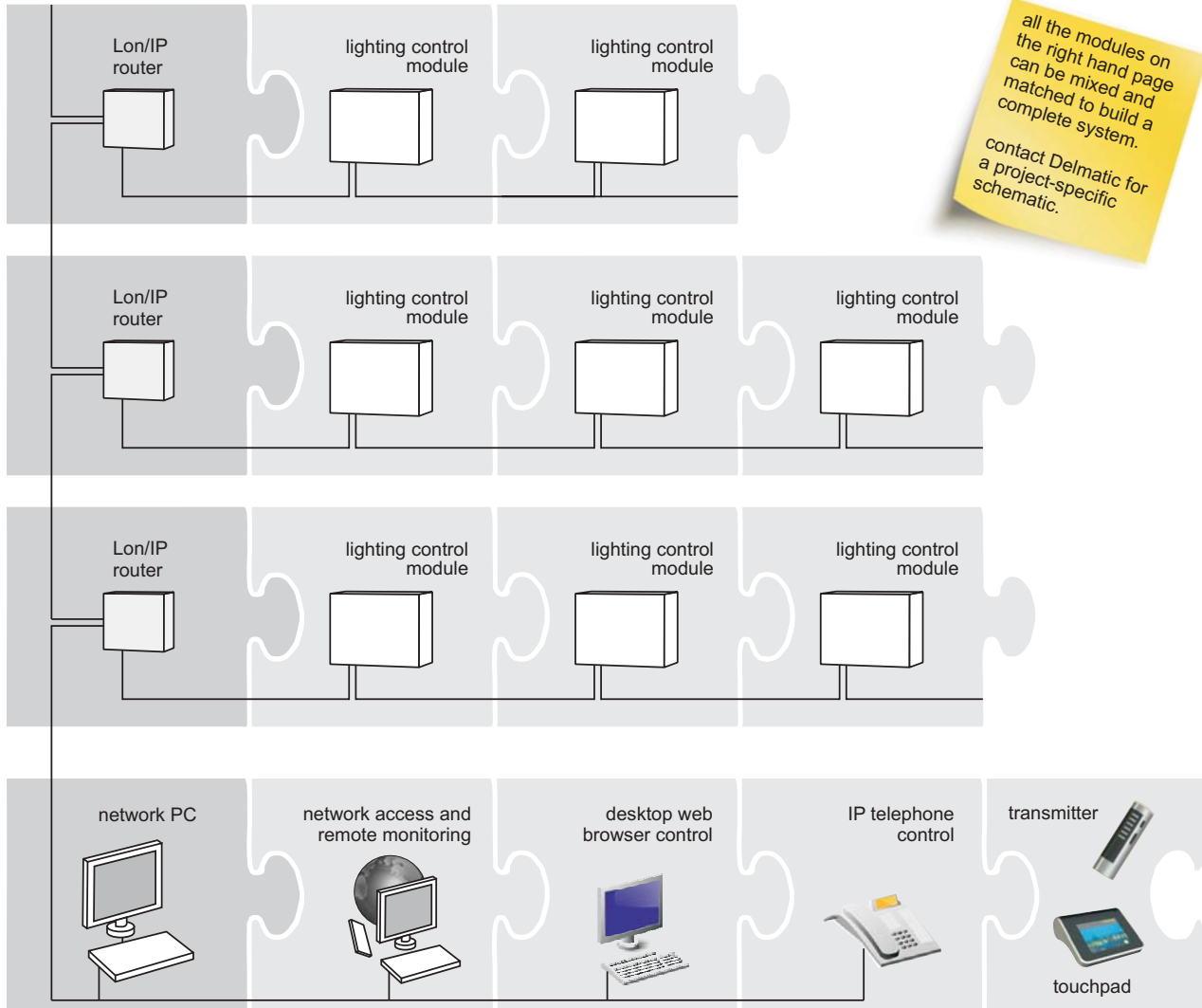
All switching modules accept dimming capsules to upgrade to analogue or digital dimming.

delmatic - typical system schematic

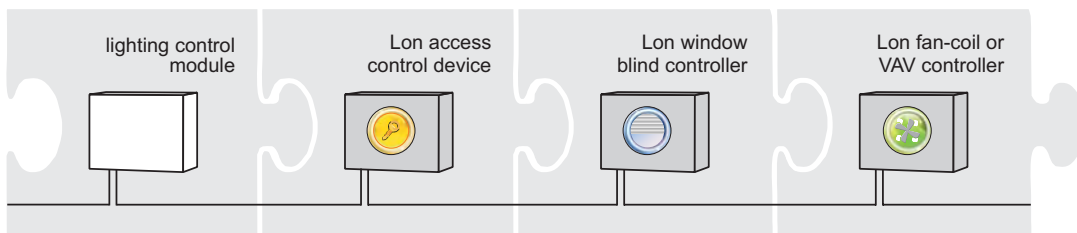
A typical system comprises a head-end PC and routers as shown in the schematic below as well as various types of lighting control modules from the selection on the right.

06

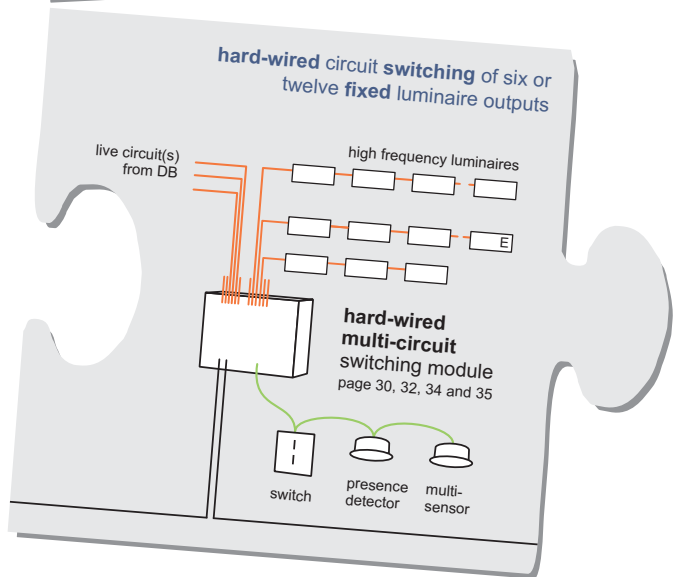
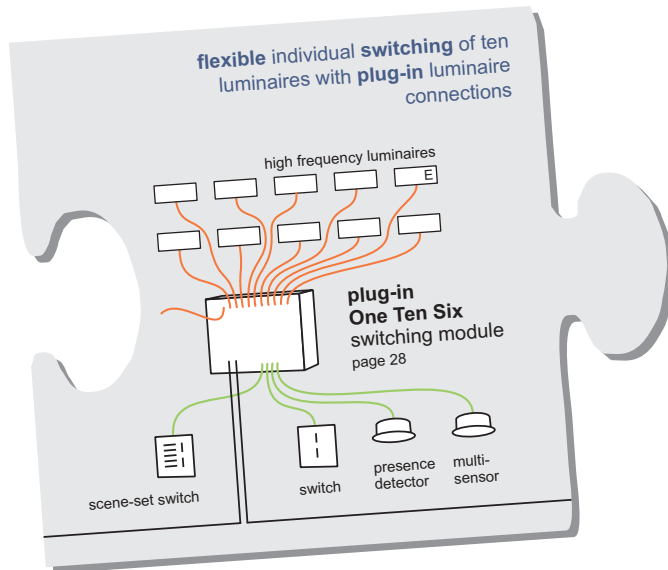
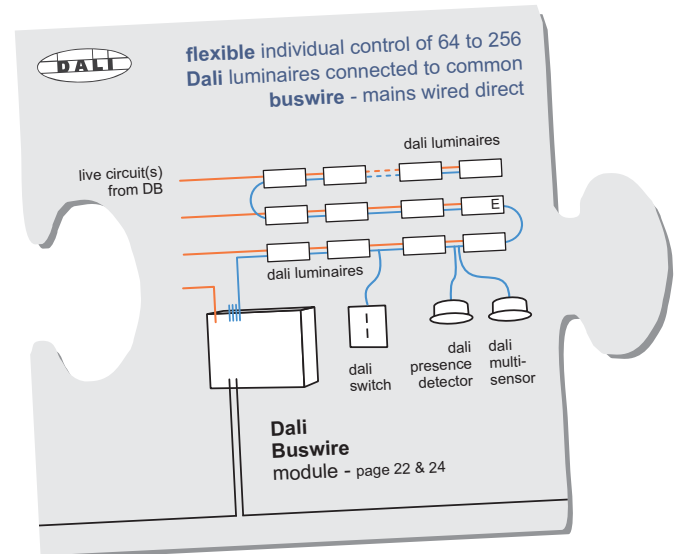
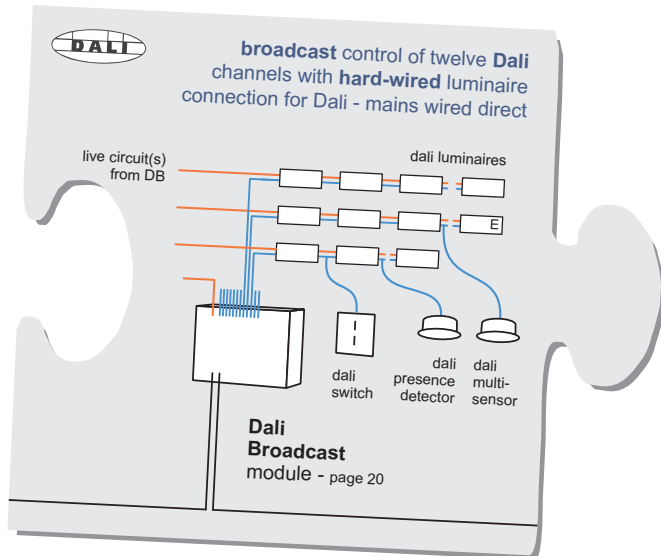
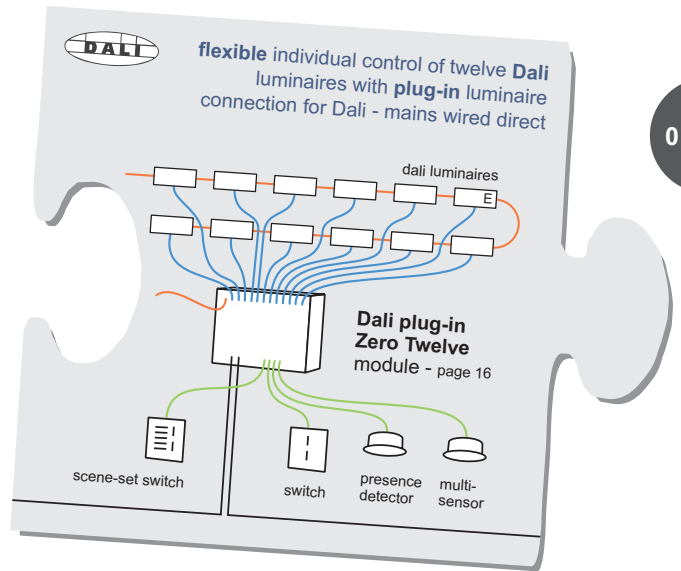
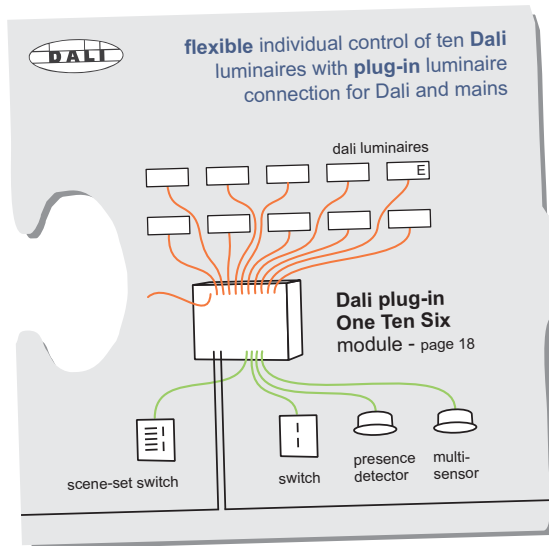
Just choose the ones that best suit the control, flexibility and installation requirements for each area of a project and slot them into place ... designing a system really is as simple as that !



Delmatic systems use Lon open technology enabling energy-efficient integration with other Lon services including access control, window blinds, fan-coils and VAV devices within a **Lon neighbourhood**.



delmatic - typical lighting control modules

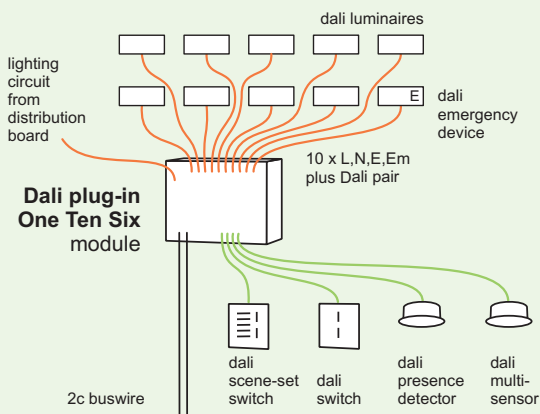


Dali technology enables luminaires to be individually addressed along a common buswire but this approach requires on-site addressing of the ballasts and may not be the best solution for all areas. We show the four main approaches below.

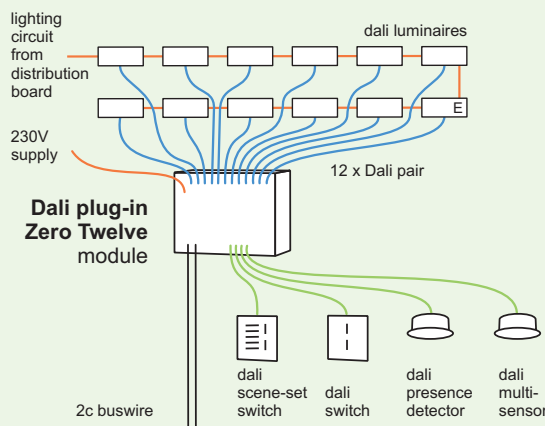
Dali plug-in approach



plug-in mains and Dali



plug-in Dali



Dali plug-in modules combine the dimming and monitoring features of Dali with the speed and convenience of plug-in connectivity.

Dali plug-in One Ten Six modules incorporate pre-addressed ports which avoid the need to address ballasts on site saving time and money.

The modules provide flexible individual control of ten Dali luminaires and are equipped with ports for the plug-in connection of the Dali pair and the switched 230V feed to each luminaire.

Local control devices plug into the module which also monitors Dali emergency devices in emergency fittings.

Dali Plug-in One Ten Six module data sheet: page 18

Dali plug-in modules combine the dimming and monitoring features of Dali with the speed and convenience of plug-in connectivity.

Dali plug-in Zero Twelve modules incorporate pre-addressed ports which avoid the need to address ballasts on site saving time and money.

The modules provide flexible individual control of twelve Dali luminaires and are equipped with ports for the plug-in connection of the Dali pair to each luminaire: the lighting circuit wires direct from the distribution board to the luminaires .

Local control devices plug into the module which also monitors Dali emergency devices in emergency fittings.

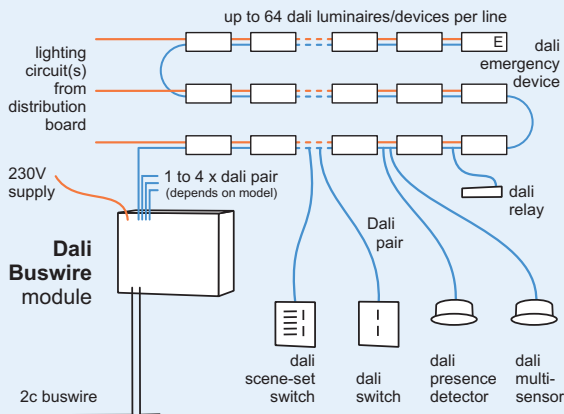
Dali Plug-in Zero Twelve module data sheet: page 16

individual control of 10 Dali luminaires	individual control of 12 Dali luminaires
on-site addressing of ballasts not required	on-site addressing of ballasts not required
individual lamp and ballast failure monitoring	individual lamp and ballast failure monitoring
individual Dali emergency light testing and monitoring	individual Dali emergency light testing and monitoring
integral relays switch off power at 0% for Zero Power	integral relays switch off power at 0% for Zero Power

Dali hard-wired approach



Dali buswire



Dali buswire modules enable flexible individual addressing, switching, dimming & monitoring of Dali luminaires connected to a common bus.

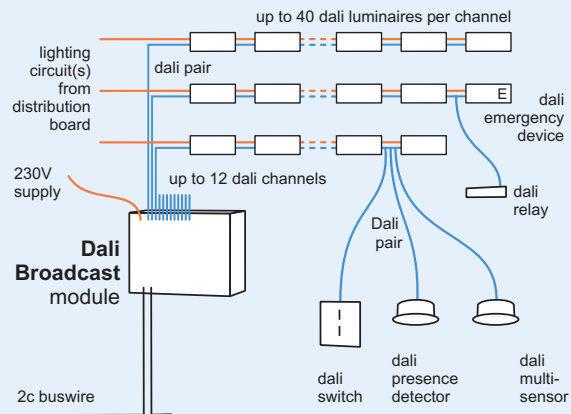
Lighting circuits wire direct from the distribution board to the luminaires while a common Dali bus connects the module to the Dali luminaire ballasts and Dali devices: the Dali bus may run alongside mains cables.

The **Dali Buswire 1** connects to up to 64 Dali devices (luminaires, detectors, multisensors, switches, relays, drivers & emergency monitoring devices) while the **Dali Buswire 4** connects to up to 4 x 64 Dali devices.

Dali Buswire 1 module data sheet: page 22

Dali Buswire 4 module data sheet: page 24

Dali broadcast



Dali Broadcast modules control hard-wired channels of Dali lighting and are frequently used in corridors and cores where dimming and monitoring is required yet flexible individual control of luminaires is not needed.

The modules incorporate pre-addressed ports which avoid the need to address ballasts on site.

Lighting circuits wire direct from the distribution board to the luminaires while a Dali bus runs from the module to each Dali channel of luminaires & devices.

The module controls 12 Dali channels each comprising up to 40 luminaires plus Dali devices per channel.

Dali Broadcast module data sheet: page 20

individual control of 64 or 256 Dali luminaires

ballasts require on-site addressing

individual lamp and ballast failure monitoring

individual Dali emergency light testing and monitoring

group control of 12 x 20 Dali luminaires

on-site addressing of ballasts not required

individual lamp/ballast failure monitoring - displayed per channel

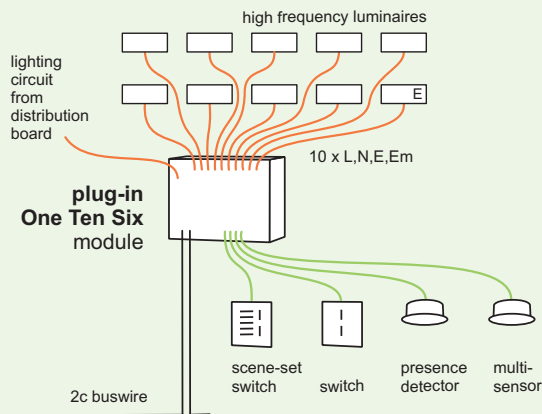
individual Dali emergency light testing and monitoring

delmatic - switching application guide

Delmatic offer a range of lighting switching solutions including flexible plug-in modules (which provide independent control of individual luminaires) and hard-wired circuit switching modules which control circuits or hard-wired groups of luminaires.

Switching

Plug-in flexible switching approach



The **plug-in switching approach** provides total flexibility with individual control of every light fitting, as well as ease and speed of installation through complete plug-in connectivity.

One Ten Six modules provide ten addressed outputs: each luminaire connects individually to the module using a flying lead/plug and is controlled by an independently addressed switching relay.

The switching modules accept a plug-in capsule to upgrade module operation to provide digital **Dali**, digital **DSI**, and analogue **1-10V** dimming.

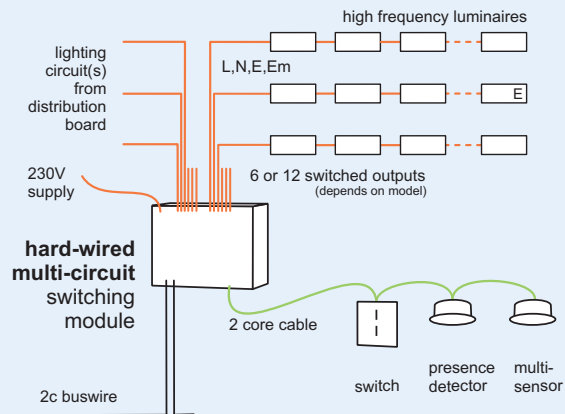
Local control devices plug into the module which also tests emergency luminaires.

Plug-in One Ten Six module data sheet: page 28

individual control of ten luminaires

integral emergency test relay

Hard-wired group switching approach



The **circuit approach** provides addressable control of lighting circuits or hard-wired groups of luminaires.

Modules accept multiple incoming lighting circuits (single or three-phase) and are equipped with heavy-duty 20A mechanically-latched switching relays: the relays retain their state in the event of loss of power or electronics failure and may be locally operated from manual override switches on the module.

Twelve Twelve modules accept 12 incoming circuits and provide 12 outputs while **Six Six** modules accept 6 incoming circuits and provide 6 outputs: local devices including presence detectors, multisensors, switches & emergency monitoring devices connect to a smart bus.

The switching modules accept a plug-in capsule to upgrade operation to provide digital **Dali**, digital **DSI**, or analogue **1-10V** dimming and may also be equipped with dimming pods for phase-dimming.

Six Six module data sheet: pages 30 and 34

Twelve Twelve module data sheet: pages 32 and 35

individual control of six or twelve hard-wired outputs

relays configurable for emergency test function

Delmatic Lightscape® software is the client's window into the lighting installation, displaying real-time information on system and lighting operation while providing building supervisors with powerful tools for managing and monitoring lighting across one or multiple sites.

The software comprises a full graphical interface which identifies each luminaire against background AutoCAD building and lighting layouts, and incorporates a hierarchy of access levels to prevent unauthorised access or modifications to the system configuration.

Lightscape features can include:

- active status of each luminaire
- dynamic feedback from system hardware
- real-time Dali lamp and ballast failure
- virtual wiring for software grouping of lighting
- drag-and-drop auto-binding configuration
- multi-level password protection and access rights
- emergency light testing and monitoring
- lamp hours-run logging
- generation of optimised luminaire relamping schedules
- adjustment of presence detector time-out period
- configuration of sensor as presence or absence detection
- adjustment of photocell sensitivity thresholds
- comprehensive calendar time scheduler
- multiple time regimes for tenanted areas
- special timing patterns for holiday periods
- astronomical solar clock functions
- loadshedding routines and scenes
- hardware monitoring & self-healing diagnostics
- integration with BMS and other head-end systems
- display and control of other Lon services eg. blinds & HVAC
- ability to export data for further analysis
- multi-client access via building IT network
- context-sensitive alerts with e-mail & PDA options
- internet access for remote monitoring and control
- network tree (architecture & hardware inventory)
- automatic remote backup and data storage

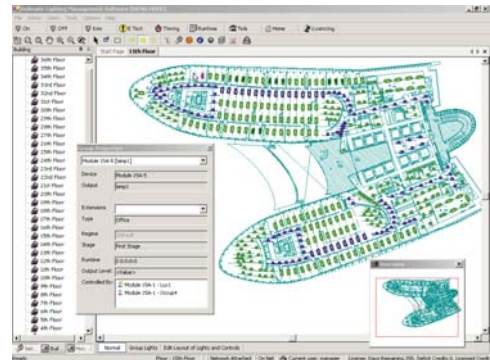


remote monitoring

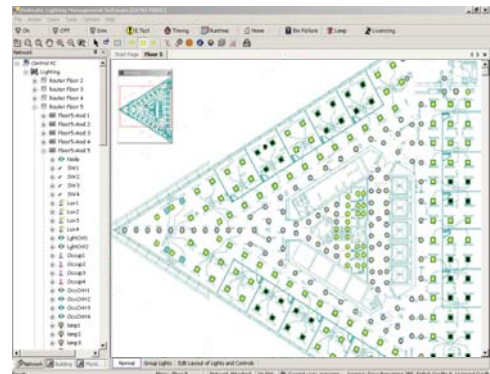
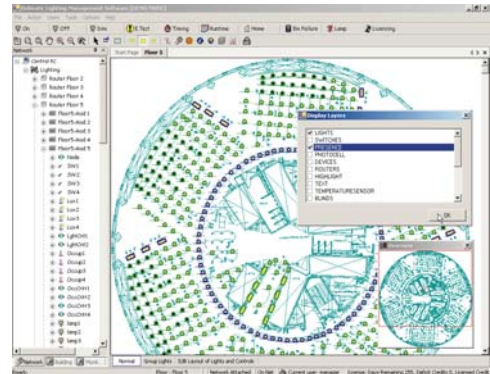
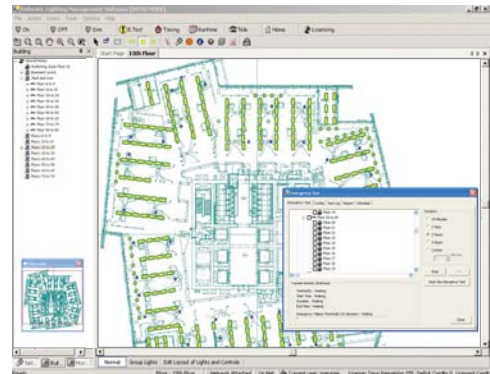
Remote monitoring enables lighting to be configured, monitored and controlled from a remote location, and system alerts to be transmitted to mobile devices.



Remote health-checks provide proactive management of the system.



the software provides real-time monitoring of the lighting installation and the ability to reconfigure switching and dimming arrangements



Delmatic systems are applied to a wide range of projects, each with differing requirements according to the type of project and the various areas within the building.

In practice, every project comprises a network of Dali and switching modules (as detailed in the application guides on the previous pages) mixed & matched to suit the requirements within different areas.

To discuss the application of a system to an individual project, contact Delmatic through one of our international offices listed below.

educational



Coventry University
Dali buswire, Dali scene-set & circuit switching

commercial offices



Marks & Spencer Head Office
Dali buswire, Dali broadcast & circuit switching

medical



The London Clinic
Dali buswire, Dali broadcast & circuit switching

laboratories



Masdar Institute of Science & Technology
Dali buswire, Dali broadcast & circuit switching

recreation



Spiceball Leisure Centre
Dali buswire, Dali broadcast & circuit switching

transportation



Dubai Metro - 47 stations
Circuit switching



The Shard, London - Dali plug-in, broadcast & buswire, circuit switching, emergency monitoring

cultural



Ickworth House
Dali buswire, circuit switching & dimming

retail



Fortnum and Mason
circuit switching, circuit dimming & digital dimming

lifestyle



Coffee shop
Dali plug-in, circuit switching and dimming

dali case study - a perfect Dali application

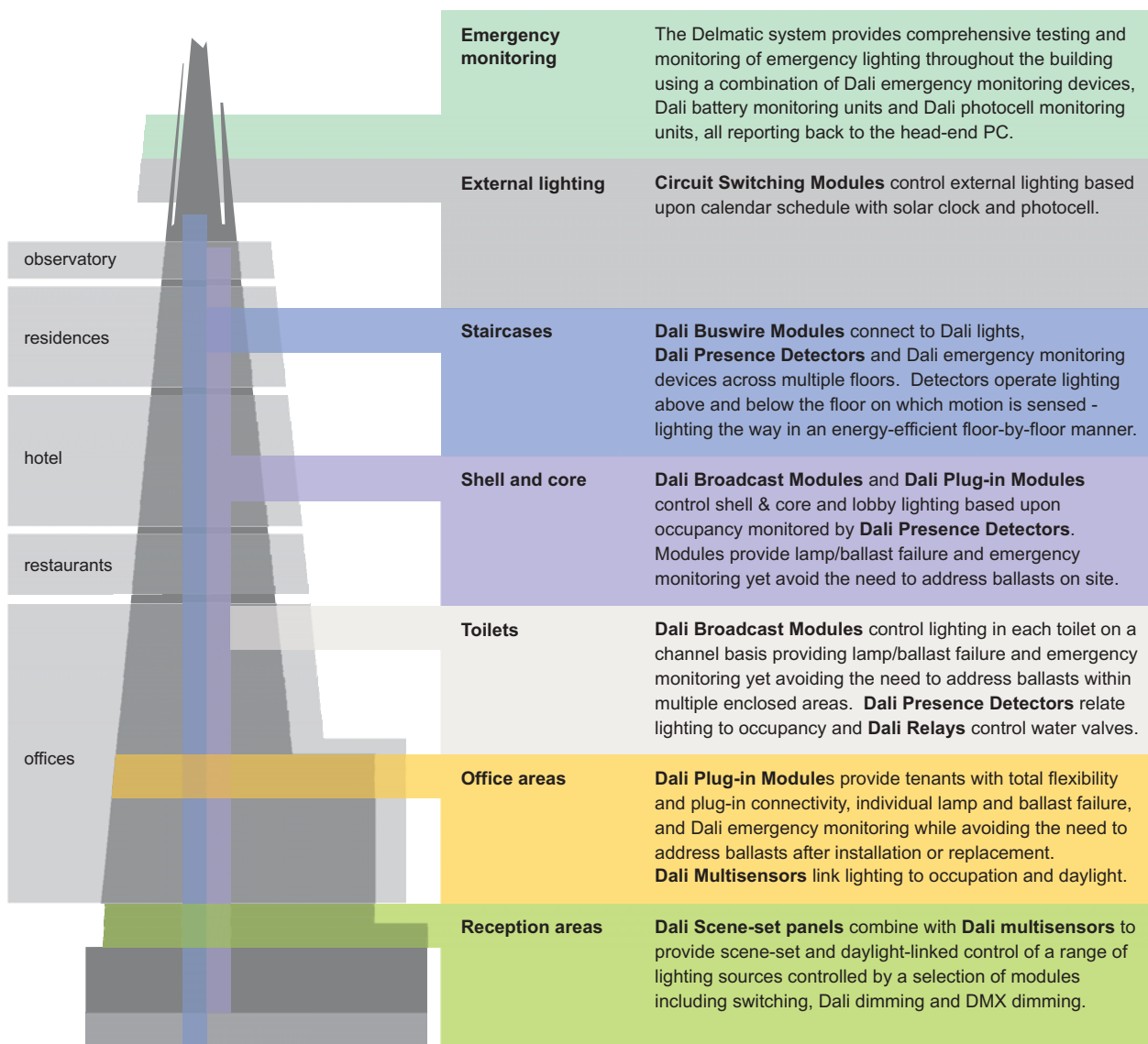


The 310m Shard is the tallest structure in Europe.

The Shard is a text-book example of how to apply Dali technology, and demonstrates the benefit of applying different Dali strategies to different areas of a building.

Dali technology is used throughout the project - within shell and core areas, staircases, lobbies and toilets, hotel and residence public areas, observatory and reception foyers, retail malls and the office tenant fit-out floors. Yet across all these areas, Dali technology is applied in different ways to best match the control flexibility required with the preferred method of electrical installation while minimising, and in many cases, avoiding entirely the need for on-site addressing of the 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 as well as Dali presence detectors, multisensors, switch-interfaces, scene-set panels, Dali relays and Dali emergency monitoring devices.



lighting management system - typical specification

1.0 Overview

The building will be equipped with a site-wide computer-addressable lighting management system providing flexible and efficient management and monitoring of lighting.

The system will comprise control modules, routers, head-end PC, and local control devices. The system will provide high-speed communication (minimum 50,000 bps) and an international open protocol as EN14908 to avoid reliance on a single vendor. The system will use handshake acknowledgments & confirmed receipt of signals between hardware.

Graphical virtual wiring software will enable lighting operation to be programmed & adapted, and allow switching patterns to be set-up and altered from the PC without the need to access equipment or carry out wiring alterations.

The system will incorporate distributed intelligence, and every module will contain built-in intelligence to ensure that local operation continues in the event of head-end PC or Router failure. For maintenance and future-proofing it will be possible to remotely upgrade on-board software on all system hardware from any point on the network. Integrity of operation is paramount and control modules shall be powered by mains power sources. To avoid single points of failure no modules will derive operating power from the buswire or any central/field bus power supplies.

2.0 Head End Software and Project Graphics package

System operation shall be monitored by a PC head-end, and project-specific graphics shall provide the following:

- Multi-level Password Access.
- Active Status of each individually addressed luminaire and hard-wired output.
- Project Specific Graphics detailing building & partition layouts and the position of each luminaire.
- Lamp Failure Status for each Dali luminaire.
- Hours Run Monitoring for each individually addressed luminaire and hard-wired output.
- Virtual Wiring enabling switching / dimming patterns to be configured through drag & drop graphics.
- Hardware Monitoring detailing the operational status of each module.
- Automatic Calendar Scheduling with multiple regimes to suit different working patterns.
- Interactive Corridor Hold Function to secure exit lighting while office areas are in use.

Contact Delmatic for an electronic version of this specification or to generate a project-specific specification.

3.0 System Hardware

3.1 Head End PC

The Head End PC will comprise (as a minimum) Intel Core i3 processor, 250GB Hard drive, 2GB RAM, CDRW, full size PCI slot, LNS network card, 17" flat screen monitor: the PC will be loaded with Windows software, the lighting management system software and project specific graphics package.

3.2 Router / IP Router.

Routers will connect the vertical and horizontal buswire networks and optimise transmission of data. Routers will provide password-protected access to master commands, emergency-test routines and monitoring functions via an LCD panel, and accept input connections for master on/off operation, load shedding and emergency-test functions. Where the lighting management system shares the IT backbone, IP Routers will be supplied and will be equipped with IP technology including 10/100 Base T Ethernet, FT-10 connections & remote web configuration.

3.3 Lighting Control Modules

Lighting Control Modules are detailed on the lighting layout drawings.

- 3.3.1 **Plug-in Lighting Control Modules** will provide ten individually addressed outputs. Modules will be equipped with ten switching / dimming ports, ten individually addressed switching relays and an emergency-test relay to control the "maintained" feed for emergency battery packs. The module will be equipped with a 3 pin connector for the plug-in connection of the incoming mains supply. The module will accept the plug-in connection of wall switches, presence detectors and multisensors. The module will use plug-in electronic technology for ease of long-term maintenance. Switching modules will accept a plug-in capsule to upgrade to Dali / DSI or analogue dimming operation.

Dali Plug-in Lighting Control Modules will provide ten individually addressed Dali outputs and be equipped with mains switching ports and relays which power off the ballasts at 0% dimming and allow control of non Dali light sources. Dali modules will assign an address to each port to avoid the need to address each ballast after installation.

Dali Plug-in "control only" Lighting Control Modules will provide ten individually addressed Dali outputs to digitally switch and dim the ballasts: mains power will wire direct from the distribution board. The modules will assign an address to each port to avoid the need to assign an address to each Dali ballast after installation.

- 3.3.2 **Dali Broadcast modules** will provide the dimming and monitoring benefits of Dali without the need to individually address each ballast post installation. Dali Broadcast Modules will provide addressable control of twelve Dali channels with up to forty Dali ballasts per channel. Dali presence detectors, Dali multisensors, Dali switches and Dali emergency test & monitoring units will also connect to the two core Dali bus channel from the module.

- 3.3.3 **Dali Buswire modules** will individually address, switch, dim and monitor individual Dali ballasts along a common two core bus cable. The address of each luminaire ballast will be assigned after installation through software via a hand-held programming device or laptop. Lighting circuit(s) powering luminaires will be wired directly from the distribution board to the luminaires: a 230V supply will provide power to the module. Dali presence detectors, Dali multisensors, Dali switches and Dali emergency test & monitoring units will also connect to the two core Dali bus from the module.
- 3.3.4 **Hard-Wired Lighting Control Modules** will provide addressable switching of lighting circuits and/or hard-wired groups of luminaires. The multi-circuit modules will be equipped with 20A mechanically-latched relays which, in the event of failure, remain in their last state and may be manually operated on and off from the module: the relays will be configurable to operate in emergency test mode to provide an emergency-test output for each controlled circuit. The modules will accept the connection of intelligent local devices including switches, presence detectors & multisensors.
- 3.4 **Local Control Devices**
 - 3.4.1 **Presence / Absence Detectors** will relate lighting to occupancy and extinguish lighting after a programmed delay following vacation of an area. The operation of each detector will be software-configurable including the mode - presence (on/off) or absence (off-only) – and the time out delay
 - 3.4.2 **Multi-Sensors** will combine presence detection with photocell measurement for daylight-linking and an infra-red receiver. The operating mode and time-out period of the presence detector as well as the sensitivity and configuration properties of the photocell will be software configurable.
 - 3.4.3 **Web Browser Control / IP Telephony** will enable users to switch and dim lighting from their desktop PC or IP phone: graphical software will enable “matching” (or importing) of telephone and PC IP addresses to luminaires.
 - 3.4.4 **Switches / Scene-Setting.** Momentary-action switches will be programmed through software to operate the relevant luminaires on/off/up/down. Scene-set panels will provide five programmed scenes together with a master raise/lower facility: an integral IR receiver will enable remote scene selection from hand-held transmitter or touchpad. Scene-set panels will indicate the current scene whether this has been initiated from the panel or centrally/automatically.
 - 3.4.5 **Touchpad.** The Touchpad will provide user control and adjustment of lighting levels and lighting scenes (and integrated control of window blinds and temperature) via a context-sensitive 3.5” LCD touchscreen.
 - 3.4.6 **Touchpanel.** The Touchpanel will provide user control and adjustment of lighting levels and lighting scenes (and integrated control of other services including AV) via a context-sensitive 10” LCD TFT touchscreen.
 - 3.4.7 **Infra-red transmitter.** The personal infra-red transmitter will provide user control of five programmed lighting scenes together with a master raise/lower facility.
- 4.0 **Emergency light testing and monitoring.** The lighting management system will provide integrated testing and monitoring of emergency lighting. Self-contained emergency luminaires will be equipped with Dali emergency devices and the system will monitor and log lamp, ballast and battery performance. The system will enable tests to be scheduled to operate automatically at intervals and durations specified within EN 50172.
- 5.0 **Interfaces and Integration**
 - 5.1 **Fire alarm interface.** The lighting management system will interface with the fire alarm system such that all exit lighting in the building is automatically switched on in the event of the fire alarm sounding.
 - 5.2 **Loadshed interface.** The lighting management system will interface with the back-up generator and hold off or dim non-essential lighting during generator conditions to avoid overload to the generator. The system will enable outputs to be configured as essential or non-essential or to operate under one of a number of loadshed scenarios.
 - 5.3 **BMS Interface.** The system will interface with the BMS for sharing of global commands and hardware status.
 - 5.4 **Integration with Lon devices.** The lighting management system will be able to integrate and interoperate seamlessly with Lon devices at a device-to-device level. These Lon devices may be connected to the lighting management system network buswire or may be on a separate network joined via a Lon Coupler.
- 6.0 **General**

The system will be supplied and commissioned by a specialist lighting control system manufacturer/supplier. The electrical contractor will purchase the system hardware and software from the supplier and will install the hardware, cabling and buswires as part of the electrical installation. The system will be supplied such that the contractor can validate power and bus wiring during installation, prior to making the system available for commissioning by the controls supplier. As part of the installation, the contractor will record the module addresses and luminaire/lamp connections on the drawings to enable preparation of the lighting management databases by the system supplier.

delmatic metro Dali zero twelve plug-in module

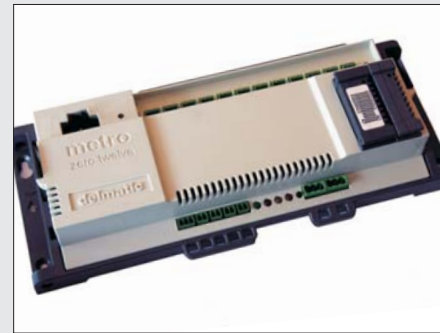


The **zero twelve** provides individual control of twelve Dali luminaires and **requires no addressing of the Dali ballasts after installation on site.**

The module provides powerful and flexible Dali control, total plug-in connectivity, distributed intelligence, and incorporates Lon technology for seamless interoperability with other Lon building services.

The module provides independent Dali dimming of up to twelve outputs and is equipped with twelve ports for the connection of the Dali pair to the luminaires: 230V power is wired direct from the distribution board to the luminaires.

The **zero twelve** enables single or two-fix installation. A robust frame, designed for screw or drop-rod mounting, accepts a clip-in module with ports for the plug-in connection of incoming mains, Dali outputs, buswire, and control devices including switches, multisensors and presence detectors.



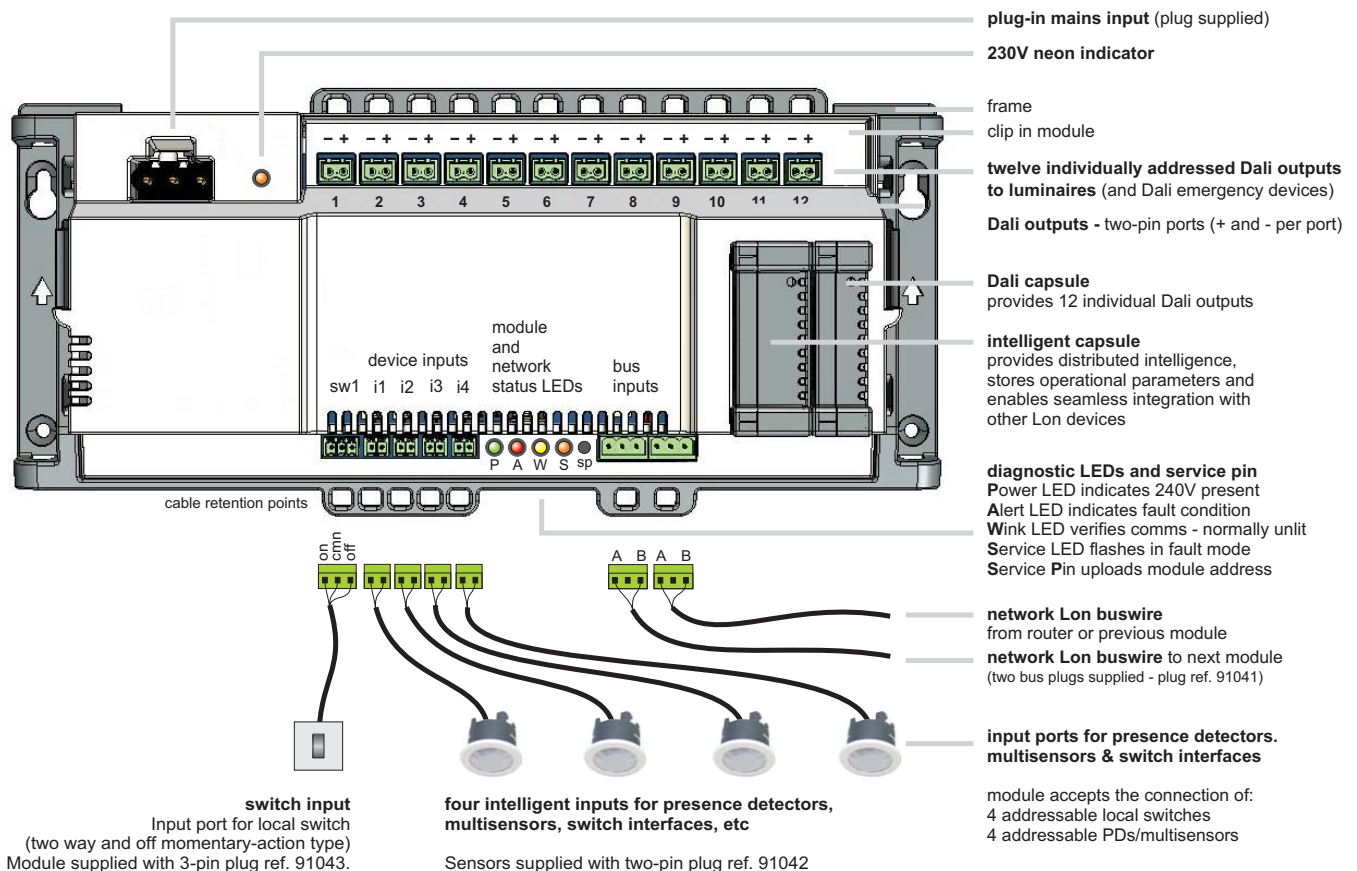
■ **metro Dali zero twelve**
product ref: 206A1

benefits of the Dali zero twelve plug-in module

The **zero twelve** module offers a number of benefits:

- reduces time & cost of commissioning by using pre-addressed ports which avoid the need to address Dali ballasts on-site after installation.
- enables ballast replacement without the need to assign an address so simplifying maintenance.
- **ideal for retrofits as addressable Dali flexibility can be added without changes to existing mains wiring.**

module features



delmatic metro Dali zero twelve plug-in module



mounting details

The module is designed for single or two-fix installation. The unit comprises:

- a robust frame fixed on drop rods or via screws
- a snap-in module.

mount the frame with the arrow pointing up

drop-rod mounting

8mm drop-rods at 325 mm centres



screw mounting

4 M5 screws at 328 x 94 mm centres



technical details

supply

1 x 220-240V~ 50/60Hz single phase supply
to be protected by external fused spur

mains outputs

230V to power luminaires is wired direct from DB to luminaires.

dimming outputs

twelve Dali dimming outputs.
the module addresses each Dali port so the Dali ballasts do not require on-site addressing.
module provides lamp and ballast failure per Dali output port.

emergency monitoring

Dali emergency monitoring devices can be connected to the Dali bus from each port and are individually addressed for emergency test and monitoring purposes.

local switch inputs

1 plug-in port (three-pin) for connection of conventional monetary action switch.
4 plug-in ports (two-pin) for connection of smart / Dali presence detectors, multisensors and scene-set devices: plug-in terminal block accepts max 1 sq.mm cable.

network Lon bus inputs

2 plug-in ports for twisted pair Lon network bus connection (max 1.5 sq.mm cable).

diagnostic LEDs

Neon - shows 240v present.
Power LED - shows secondary power circuit operational.
Alert LED - indicates Short on the sensor bus or issue with Communication card.
Wink LED verifies communications
Service LED - flashing indicates fault mode.

buswire specification

330 V rms - twisted pair Belden 7701NH unshielded 22 AWG stranded.
600 V rms - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid.

dimensions (mm)

345 w x 155 h x 60 d
100mm depth including mains plug

construction

flame-retardant low smoke moulded housing

ambient temperature / relative humidity

0 to +50°C / 20% to 90% non condensing



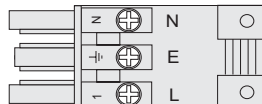
Lon specifications

Echelon LonWorks FT5000 Neuron
FTX3 free topology transceiver
64kb EEPROM

Conforms to LonMark 3.4 guidelines and profiles
4 switch objects #3200
4 light sensor objects #1010
4 occupancy sensor objects #1060
12 open loop actuator objects #0003
4 occupancy controller objects #3071
4 light controller objects #3050

plug details

mains input to module (plug supplied)
(Live, Earth, Neutral)



3 pole female plug
with locking device

dali output to luminaire
(plug supplied)

(Dali - and Dali +)



delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
sales@delmaticsaudi.com

delmatic metro Dali plug-in one ten six module



The **Dali plug-in** module provides individual control of ten Dali luminaires and **requires no addressing of the Dali ballasts on site.**

The module provides powerful and flexible Dali control, total plug-in connectivity, distributed intelligence, and incorporates Lon technology for seamless interoperability with other Lon building services.

The module is equipped with ten individually addressed relays which save energy by switching off power to the ballasts at 0% output (avoiding wasteful standby power consumption) and also allow control of non-Dali light sources.

The **metro one ten six** enables single or two-fix installation. A robust frame, designed for screw or drop-rod mounting, accepts a clip-in module with ports for the plug-in connection of incoming mains, luminaire outputs, buswire & control devices. The module accepts the plug-in connection of multisensors, presence detectors and switches.



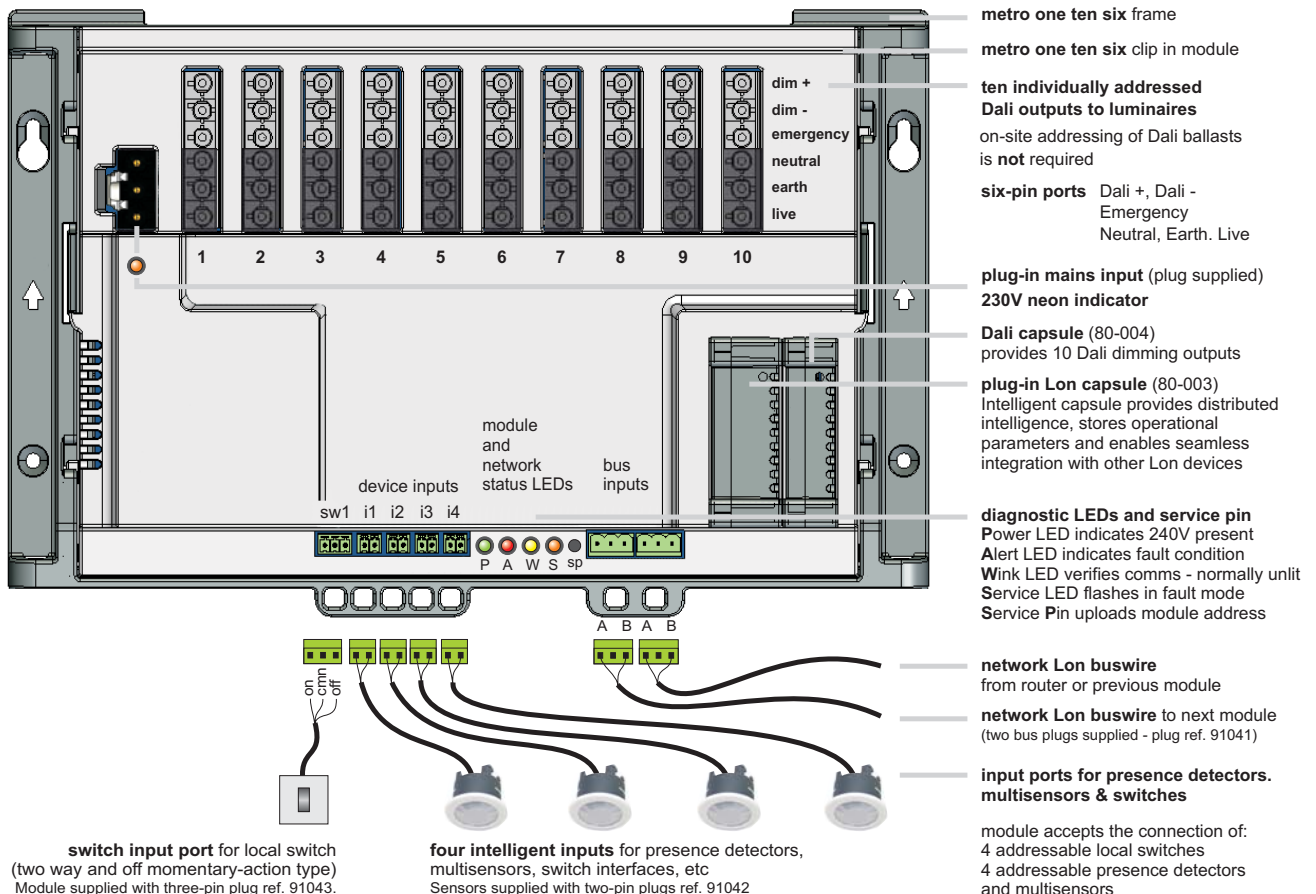
■ **metro Dali plug-in one ten six**
product ref: 201B1

benefits of the Dali plug-in one ten six

The **Dali plug-in** module offers a number of benefits:

- reduces the time and cost of commissioning by using pre-addressed ports which avoid the need to address Dali ballasts on-site.
- enables ballast replacement without the need to assign an address so simplifying maintenance.
- saves energy by switching off power to ballasts at 0% output so avoiding standby power consumption.
- enables the connection & control of non-Dali sources including tungsten lamps, fan-coils etc.

module features



delmatic metro Dali plug-in one ten six module



mounting details

The **metro one ten** is designed for single or two-fix installation. The unit comprises:

- a robust frame fixed on drop rods or via screws
- a snap-in module.

mount the frame with the arrow pointing up

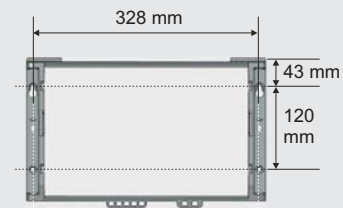
drop-rod mounting

8mm drop-rods at 325mm centres



screw mounting

4 M5 screws at 328 x 120mm centres



technical details

supply

1 x 220-240V~ 50/60Hz single phase 10A lighting circuit protected by 10A MCB (3 pin plug-in connector supplied)

Dali outputs

10 Dali dimming outputs.

Dali ballasts are auto-addressed and do not require on-site addressing

Module provides lamp/ballast failure per Dali output.

Dali emergency devices connect to the Dali bus from the luminaire port

switched 230V outputs

10 individually switched outputs (10A resistive, 3A inductive)

1 emergency test output

local switch inputs

1 plug-in port (three-pin - sw1) for connection of conventional monetary action switch.

4 plug-in ports (two-pin - i1-i4) for connection of smart / Dali presence detectors, multisensors and scene-set devices: plug-in terminal block accepts max 1 sq.mm cable.

network Lon bus inputs

2 plug-in ports for twisted pair Lon network bus connection (max 1.5 sq.mm cable).

diagnostic LEDs

Neon - shows 240v present.

Power LED - shows secondary power circuit operational.

Alert LED - indicates short on the sensor bus or issue with Communication card.

Wink LED - winks when instructed through software

Service LED - indicates fault mode.

buswire specification

330 V rms - twisted pair Belden 7701NH unshielded 22 AWG stranded.

600 V rms - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid.

dimensions (mm)

345 w x 210 h x 55 d (excludes plugs)
100 mm depth including capsule & plugs

construction

flame-retardant low smoke moulded housing

ambient temperature / relative humidity

0 to +50°C / 20% to 90% non condensing



Lon specifications

Echelon LonWorks FT 5000 Smart Transceiver
FTX3 free topology communications transformer
64k EEPROM

Conforms to LonMark 3.4 guidelines and profiles

4 switch objects #3200

4 light sensor objects #1010

4 occupancy sensor objects #1060

10 open loop actuator objects #0003

4 occupancy controller objects #3071

4 light controller objects #3050

plug details

mains input to module (plug supplied)

(Live, Earth, Neutral)

3 pole female plug with locking device

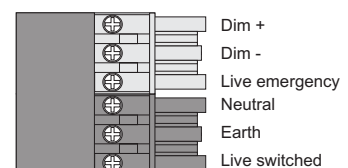


output to dimmed & emergency luminaires

(Live, Earth, Neutral, Emergency L, Dim -, Dim +)

6 pole without locking device

Wieland ref: 34.362.0211.1



delmatic

www.delmatic.com

London, UK

+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE

+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar

+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia

+966 (0)1 211 8170
sales@delmaticsaudi.com

delmatic metro Dali Broadcast module



The **Dali Broadcast module** provides powerful control of up to 480 Dali luminaires across twelve Dali channels.

The module is typically used in areas such as carpark, corridors, and cores where control of individual luminaires is not required yet there is a requirement for adjustment of lighting levels through dimming.

The broadcast approach provides the dimming and monitoring benefits of Dali without the need to address ballasts on site: the module broadcasts commands to channels of Dali fittings while monitoring each luminaire.

Dali presence detectors, multisensors & switches connect direct to the Dali channel cables while Dali emergency devices also connect to the Dali buswire.

The module incorporates distributed intelligence, non-volatile memory, and a Lon neuron for seamless interoperability with other Lon building services.



■ **metro Dali Broadcast module**
product ref: 204A1

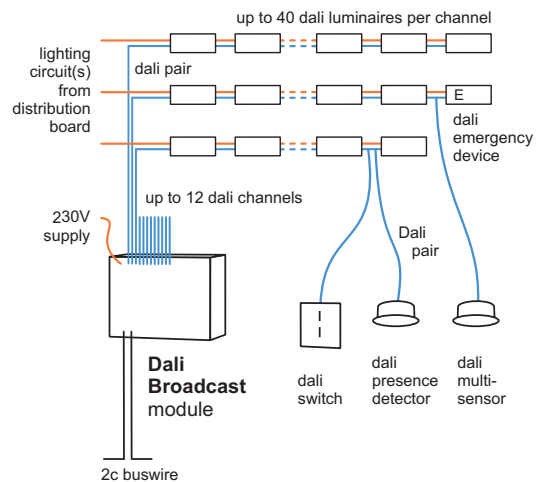
Dali broadcast application

The module provides twelve individually addressed Dali channel outputs with up to forty luminaires per channel.

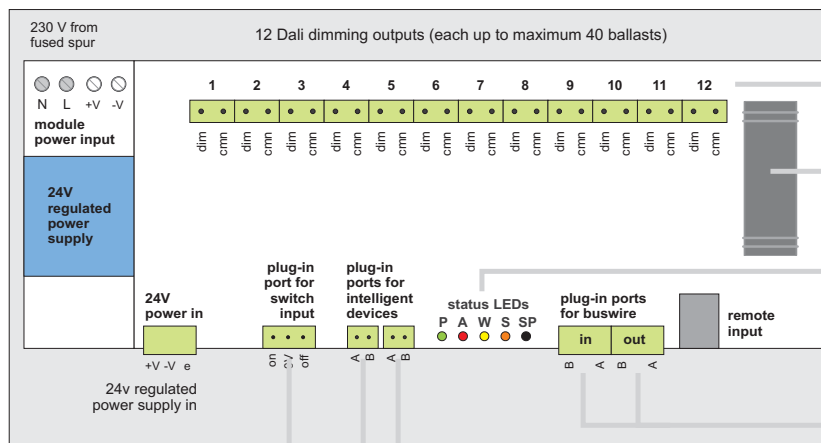
The module connects via a two-core cable to Dali ballasts on each channel as well as to Dali devices including presence detectors, multisensors & switches which control lighting on the channel: Dali emergency devices also connect to the two-core Dali cable. The module broadcasts independent switching and dimming commands to each channel while individually monitoring each lamp/ballast and emergency device for healthy operation or failure.

Lighting circuits are wired direct from the distribution board to the luminaires and a 230V supply powers the module electronics.

The module connects to the lighting management Lon bus and integrates Dali sub-networks into a building-wide network with the option of seamless interoperability with other Lon building services.



module features



Dali channel terminals - twelve sets of plug-in terminals for connection of two core Dali dimming output to luminaire ballasts: up to forty ballasts per output / channel.

plug-in intelligent Lon capsule (80-003) provides distributed intelligence, stores module operational parameters and enables seamless integration with other Lon devices

diagnostic/status LEDs and service pin
Power LED indicates 240V present
Alert LED indicates fault condition
Wink LED verifies comms - normally unlit
Service LED flashes in fault mode
Service Pin uploads module address

bus terminals - plug-in terminals for connection of two core Lon bus (from router or previous module and to next module). (two bus plugs supplied - plug ref. 91041)

switch input for three core cable (on/off/common) from retractive switch
Module supplied with three-pin plug ref. 91043.

intelligent device inputs for connection of two core cable to devices including switches and sensors
Module supplied with two-pin plugs ref. 91042

delmatic metro Dali Broadcast module



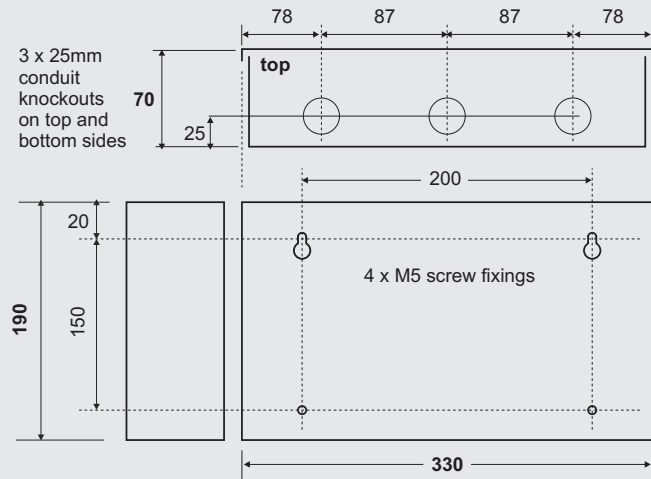
mounting, installation and dimensions

The module should be installed in an accessible location, ideally at a height of 1.5m from floor level.

The back box is mounted using four M5 screw fixings: the top two holes use keyhole fixings for ease of installation.

Top and bottom sides contain 3 x 25mm conduit entry knockouts.

All dimensions in millimetres.



technical details

supply

1 x 220-240V~ 50/60 Hz single phase circuit to power module

protection

module requires external protection by 10A MCB

Dali dimming outputs and connection

twelve Dali digital dimming channel outputs - up to forty Dali digital ballasts per channel.

2-pin plug-in port per Dali channel (max 1.5 sq.mm cable)

Dali sensors, switches and emergency devices

Dali sensors (presence detectors and multisensors), Dali switches and switch interfaces connect to the Dali channel bus and control Dali lighting on that channel: Dali emergency monitoring devices connect to the Dali channel bus.

Module accepts one direct input from momentary-action (retractive) switch

Module accepts connection of up to twelve intelligent switches and sensors on intelligent bus input cable for cross-channel control.

- intelligent bus plug-in terminal block accepts max 1 sq.mm cable.

- intelligent bus cable maximum length - 100m

Dali bus specification and length: recommended minimum Dali cable conductor size

up to 100 metres - 0.5 sq.mm - use Belden 8205

100 to 150 metres - 0.75 sq.mm

150 to 300 metres max - 1.5 sq.mm

Lon bus connection

2 plug-in ports for twisted pair Lon bus connection (max 1.5 sq.mm cable)

Lon bus specification

330 V rms - twisted pair Belden 7701NH unshielded 22 AWG stranded

600 V rms - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

dimensions (mm)

330 w x 190 h x 70 d

construction

painted galvanised steel enclosure & lid to IP50 finished in RAL 7035 50% gloss

ambient temperature / relative humidity

0 to +50°C / 20% to 90% no condensation

Lon specifications

Echelon LonWorks FT 5000 Smart Transceiver

FTX3 free topology communications transformer

64k EEPROM

Conforms to LonMark 3.4 guidelines and profiles



delmatic

www.delmatic.com

London, UK

+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE

+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar

+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia

+966 (0)1 211 8170
sales@delmaticsaudi.com

delmatic metro Dali Buswire One module



The **Dali Buswire One** provides flexible individual addressing, switching, dimming & monitoring of Dali luminaires connected to a common Dali buswire: Dali presence detectors, multisensors, switches and emergency monitoring devices also connect to the Dali buswire.

The module may be configured to maximise the number of connected Dali devices or maximise grouping flexibility. Maximum ballast count is achieved by connecting the Dali maximum of sixty-four ballasts and controlling these as up to sixteen Dali groups: maximum flexibility is achieved by connecting a reduced number of ballasts or devices and using custom software which overcomes the traditional Dali limitation of sixteen groups.

The module incorporates distributed intelligence & non-volatile memory which stores operational parameters, monitors lighting status including lamp hours-run data and incorporates lamp and ballast failure detection.



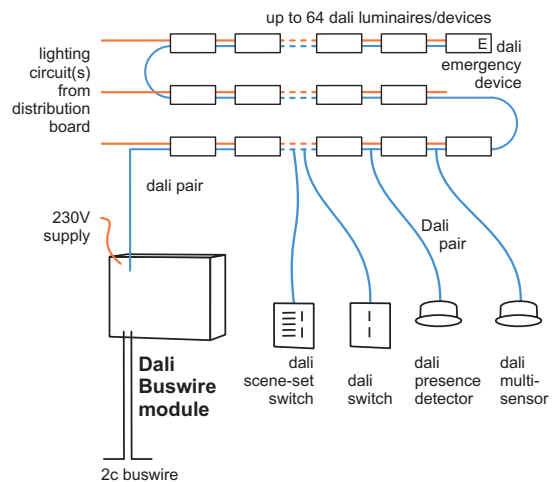
■ **metro Dali Buswire One**
product ref: 205A1

The **Dali Buswire One module** connects to up to 64 Dali devices including luminaires, presence detectors, multisensors, switches, relays, drivers & emergency monitoring devices.

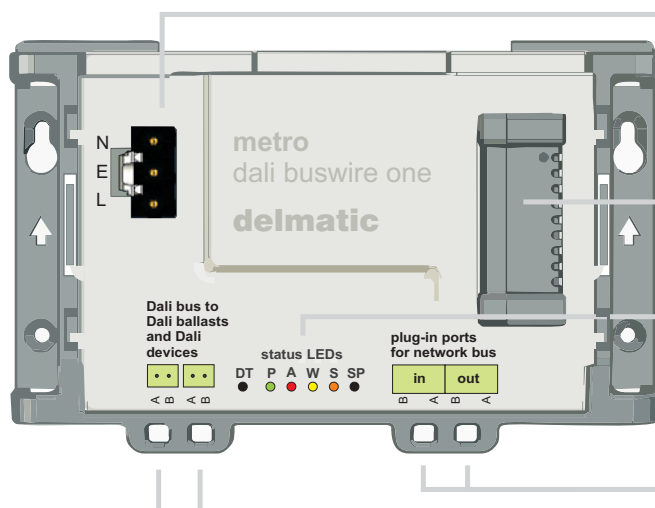
The module connects via a two-core cable to the Dali ballasts and Dali devices. Lighting circuits are wired direct from the distribution board to the luminaires and the module derives its operating power from the lighting circuit or separate 230V supply: the Dali bus may run alongside mains cables.

The distributed intelligence module individually addresses & monitors each luminaire and device and provides real-time feedback of lamp and ballast failure. An integral test button enables the operation of the Dali luminaires to be verified prior to configuration of the system.

The **Dali Buswire One** connects to the lighting management Lon bus and integrates Dali sub-networks into a building-wide network with the option of seamless interoperability with other Lon building services.



module features



plug-in mains input (plug supplied with module)
frame with clip-in module

plug-in intelligent Lon capsule (80-003)
provides distributed intelligence, stores module operational parameters and enables seamless integration with other Lon devices

diagnostic LEDs and service pin

Power LED - indicates module is powered up

Alert LED - lights to indicate a short on the Dali bus

Wink LED - winks when instructed by software

Service LED - lights when service pin pressed and flashes if module has no application software

SP service pin - uploads module address

DT Dali test button - pressing button for 2 seconds transmits an on/off/dimming command to all ballasts enabling the operation of luminaires to be verified.

Lon bus - plug-in terminals for connection of two core Lon bus (from router or previous module and to next module). plug ref. 91041

Dali bus to up to 64 Dali ballasts/devices. plug ref. 91040 connects to D+ & D- (two ports operate in parallel)



Dali Buswire One applications

Buswire installation

The **Dali Buswire One** can connect to multiple Dali luminaires/ballasts and Dali devices via a two-core buswire or flexible conduit installation: each luminaire is independently addressed, dimmed & monitored.

Lighting circuits are wired direct to the luminaires: the Dali bus can run alongside mains cables or as part of a five core cable.

Busbar installation

The **Dali Buswire One** benefits busbar installations through the ability to individually control luminaires connected to a shared busbar.

3 poles of a 5-pole busbar provide L, N & E connections to luminaires: the Dali output from the Dali Buswire Module connects to the remaining 2 poles of the bar for the connection of Dali luminaires/ballasts and Dali devices.

Chilled beam installation

The **Dali Buswire One** benefits chilled beam installations through the ability to individually control luminaires and attach Dali sensors/switches to a single two core bus within the beam.

The lighting circuit is wired direct to the luminaires and a two core cable wires from the Dali Buswire module to the Dali ballasts and devices.

Dali technology enables up to 64 devices (ballasts, presence detectors, multisensors, switches etc) to be connected to a common buswire. **However the ability to individually address luminaires along a common buswire requires each ballast to be assigned a unique address on site after installation with associated time and cost considerations:** addresses are assigned using a hand-held programmer or laptop computer.

To avoid the need to address ballasts on-site, Delmatic offer a range of Dali controllers including the Dali Broadcast Module and the Dali Plug-in Module.

technical details

supply

1 x 220-240V~ 50/60Hz single phase circuit to power module.
(3 pin plug-in mains input connector supplied)

protection

Module requires external protection by 10A MCB.

Dali bus connection

two 2-pin ports for Dali bus connection (max 1.5 sq.mm cable).
Dali sensors (presence detectors and multisensors), Dali switches and switch interfaces, and Dali emergency devices connect to the Dali buswire.
The two ports operate in parallel.

Dali bus specification and length

recommended minimum Dali cable conductor size
up to 100 metres - 0.5 sq.mm - use Belden 8205
100 to 150 metres - 0.75 sq.mm
150 to 300 metres max - 1.5 sq.mm

Lon bus connection

2 plug-in ports for twisted pair Lon bus connection (max 1.5 sq.mm cable)

Lon bus specification

330 V rms - twisted pair Belden 7701NH unshielded 22 AWG stranded
600 V rms - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

Lon specifications

Echelon LonWorks FT5000 Neuron
FTX3 free topology transceiver
64kb EEPROM
Conforms to LonMark 3.4 guidelines and profiles



dimensions (mm) 225 w x 133 h x 66 d
100mm depth including mains plug

construction

flame-retardant low smoke moulded housing

ambient temperature / relative humidity

0 to +50°C / 20% to 90% non condensing

mounting

The module is designed for wall or soffit mounting using four M5 screw fixings or two 8mm droprods.

delmatic metro Dali Buswire Four module

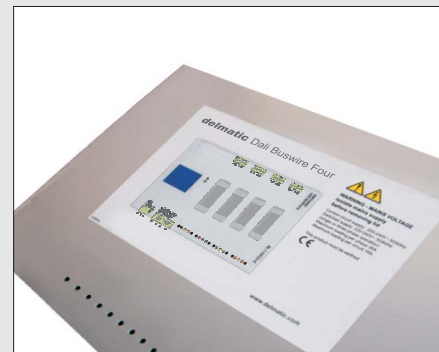


The **Dali Buswire Four** provides individual addressable control up to 256 Dali luminaires and acts as a hub for four Dali networks of 64 devices each.

The module enables Dali presence detectors, Dali multisensors, Dali switches, Dali emergency monitoring devices & Dali relays to connect to the Dali bus, avoiding the need to wire separate cables to local control devices .

The module incorporates distributed intelligence & non-volatile memory which stores operational parameters, monitors lighting status including lamp hours-run data and incorporates lamp and ballast failure detection.

The module combines the Dali dimming protocol with Lon building-services open-protocol so that Dali lighting forms part of an integrated system with the option of seamless interoperability with other Lon building services.



■ **metro Dali Buswire Four**
product ref: 207A1

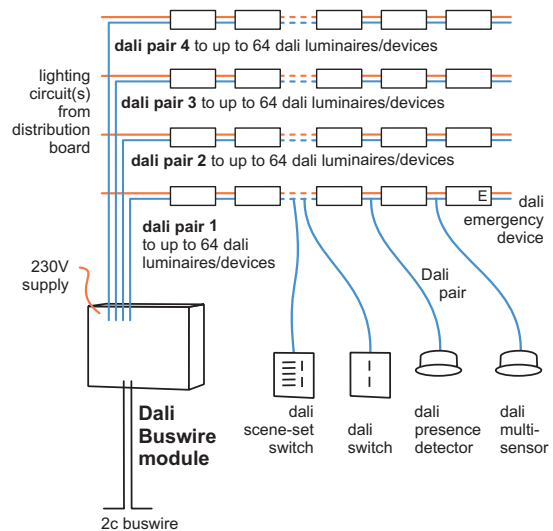
24

The **Dali Buswire Four** module connects to up to 256 Dali devices including luminaires, presence detectors, multisensors, switches, relays, drivers & emergency monitoring devices.

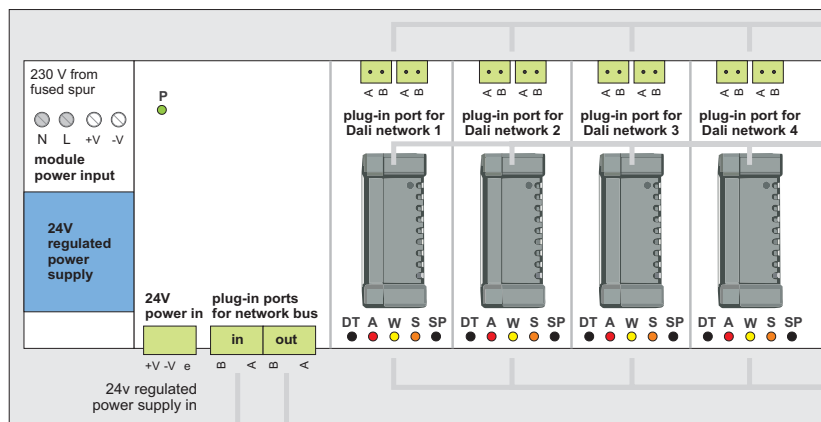
The module connects via four two-core cables to up to 64 Dali ballasts and devices on four Dali cable runs. Lighting circuits are wired direct from the distribution board to the luminaires and the module derives its operating power from the lighting circuit or separate 230V supply: the Dali bus may run alongside mains cables.

The distributed-intelligence module individually addresses & monitors each luminaire and device, and provides real-time feedback of lamp and ballast failure. An integral test button enables the operation of the Dali luminaires to be verified prior to configuration of the system.

The **Dali Buswire Four** connects to the lighting management Lon bus and integrates Dali sub-networks into a building-wide network with the option of seamless interoperability with other Lon building services.



module features



Dali network terminals to four Dali networks: each network connects to up to 64 Dali ballasts/devices: Two core Dali bus cable per network. Two ports for each network operate in parallel. (two bus plugs supplied per network - plug ref. 91040)

four **plug-in intelligent Lon capsule** (80-003) provides distributed intelligence, stores module operational parameters and enables seamless integration with other Lon devices: one capsule per Dali network

diagnostic LEDs and service pin

Power LED - indicates module is powered up

DT Dali test button - pressing button for 2 seconds transmits an on/off/dimming command to all ballasts enabling the operation of luminaires to be verified.

Alert LED - lights to indicate a short on the Dali bus

Wink LED - winks when instructed by software

Service LED - lights when service pin pressed and flashes if module has no application software

SP service pin - uploads module address

bus terminals - plug-in terminals for connection of two core Lon bus (from router or previous module and to next module). (two bus plugs supplied - plug ref. 91041)

Dali Buswire Four applications

Buswire installation

The **Dali Buswire Four** can connect to multiple Dali luminaires and devices via four two-core buswires or flexible conduit installation: each luminaire is independently addressed, dimmed & monitored along the buswire.

Lighting circuits are wired direct to the luminaires: the Dali bus can run alongside mains cables or as part of a five core cable.

Busbar installation

The **Dali Buswire Four** benefits busbar installations through the ability to individually control luminaires connected to a shared busbar.

3 poles of a 5-pole busbar provide L, N & E connections to luminaires: the Dali outputs from the Dali Buswire Four module connect to the remaining 2 poles of the bar for the connection of Dali luminaires and Dali devices.

Chilled beam installation

The **Dali Buswire Four** benefits chilled beam installations through the ability to individually control luminaires and attach Dali sensors/switches to a single two core bus within the beam.

The lighting circuit is wired direct to the luminaires and a two-core cable wires from the Dali Buswire Four module to the Dali ballasts and devices on each of the four Dali networks.

Dali technology enables up to 64 devices (ballasts, presence detectors, multisensors, switches etc) to be connected to each of the four Dali networks from the Dali Buswire Four module. **However the ability to individually address luminaires along a common buswire requires each ballast to be assigned a unique address on site after installation with associated time and cost considerations:** addresses are assigned using a hand-held programmer or laptop computer.

To avoid the need to address ballasts on-site, Delmatic offer a range of Dali controllers including the Dali Broadcast Module and the Dali Plug-in Module.

technical details

supply

1 x 220-240V~ 50/60Hz single phase circuit to power module.
(3 pin plug-in mains input connector supplied)

protection

Module requires external protection by 10A MCB.

Dali bus connection

eight 2-pin ports for four Dali network bus connections (max 1.5 sq.mm cable).
Dali sensors (presence detectors and multisensors), Dali switches and switch interfaces, and Dali emergency devices connect to the Dali buswire.
The two ports per network operate in parallel.

Dali bus specification and length

recommended minimum Dali cable conductor size
up to 100 metres - 0.5 sq.mm - use Belden 8205
100 to 150 metres - 0.75 sq.mm
150 to 300 metres max - 1.5 sq.mm

Lon bus connection

2 plug-in ports for twisted pair Lon bus connection (max 1.5 sq.mm cable)

Lon bus specification

330 V rms - twisted pair Belden 7701NH unshielded 22 AWG stranded
600 V rms - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

Lon specifications

Echelon LonWorks FT5000 Neuron
FTX3 free topology transceiver
64kb EEPROM
Conforms to LonMark 3.4 guidelines and profiles



dimensions (mm) 335 w x 100 h x 70 d

construction

painted galvanised steel enclosure & lid
to IP50 finished in RAL 7035 50% gloss

ambient temperature / relative humidity

0 to +50°C / 20% to 90% non condensing

mounting

The module is designed for wall or soffit mounting
using four M5 screw fixings or two 8mm droprods.

delmatic metro Dali one relay



The **dali one relay** provides addressable control of non-Dali light sources and other devices such as fan-coils, blinds etc within a Dali environment.

The unit is typically used in applications where the majority of controlled lights are Dali and yet certain luminaires are not available with Dali ballasts but need to be switched, or where other devices such as water valves, VAV units or window blinds require to be controlled.

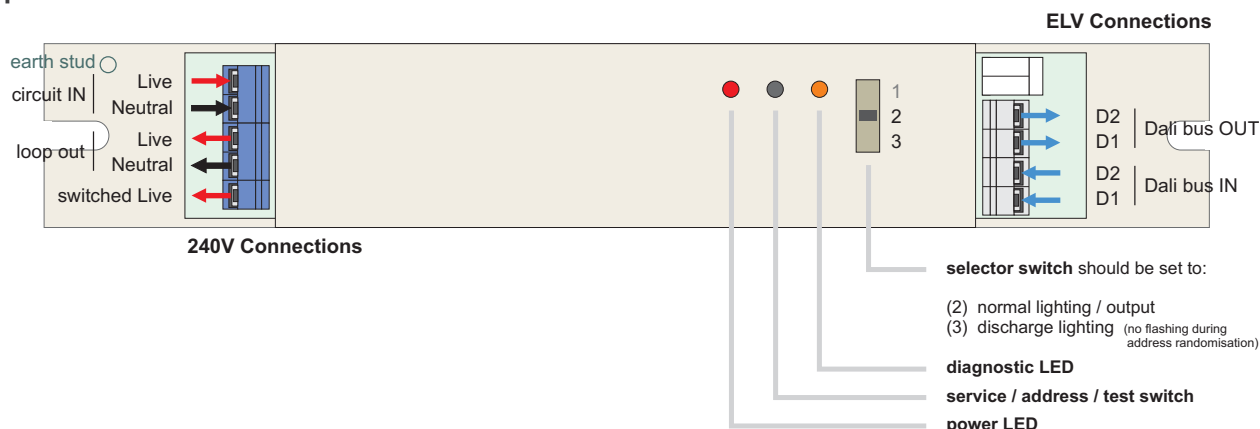
The **dali one relay** connects to the Dali buswire which links Dali luminaires, sensors and other devices to the Dali control module: the 16A mechanically-latched relay operates in response to commands transmitted along the Dali bus.

The unit derives its power from the incoming 230V circuit. Integral LEDs indicate power & diagnostic functions while a selector switch configures the relay for control of normal lighting or discharge lighting (inhibiting frequent switching).



■ **dali one relay**
product ref: 208A1

product details



connection

The **dali one relay** is compatible with the complete range of Delmatic Dali control modules. The unit may connect to:

- the Dali bus from the **Dali Buswire module** which connects to Dali luminaires and Dali devices,
- the Dali bus on any or all of the twelve channels from the **Dali Broadcast module**,
- Dali outputs from the **Zero Twelve Dali plug-in module**.

technical details

supply

1 x 220-240V~ 50/60Hz single phase 10A lighting circuit

switched output

1 x 16A switched output (max 1.5 sq.mm cable)

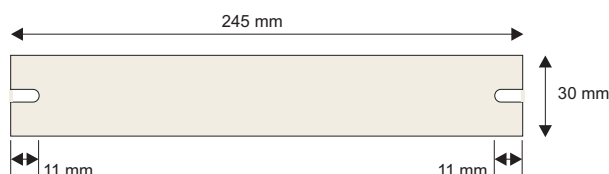
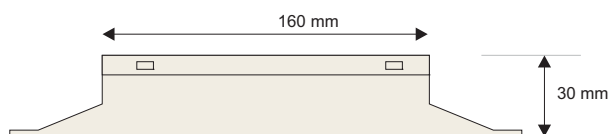
Dali bus inputs

2 plug-in ports (two-pin) for bus connection (max 1.5 sq.mm cable)

construction / ambient temp / relative humidity

metal enclosure / 0 to +50°C / 20% to 90% non condensing

dimensions and mounting details



delmatic metro Dali emergency monitoring unit



The **dali emergency monitoring unit** forms part of the metro emergency lighting test and monitoring package and is typically used with fittings for which an intelligent Dali emergency inverter device is not available.

The unit is equipped with an integral emergency-test relay which controls the maintained feed to the battery pack. Upon receipt of an emergency-test command, the integral relay opens, causing a loss of maintained feed to the battery such that the emergency lamp is powered from the local battery: the unit monitors the battery output for the duration of the test and transmits pass/fail data via the Dali module to the network PC for analysis and logging.

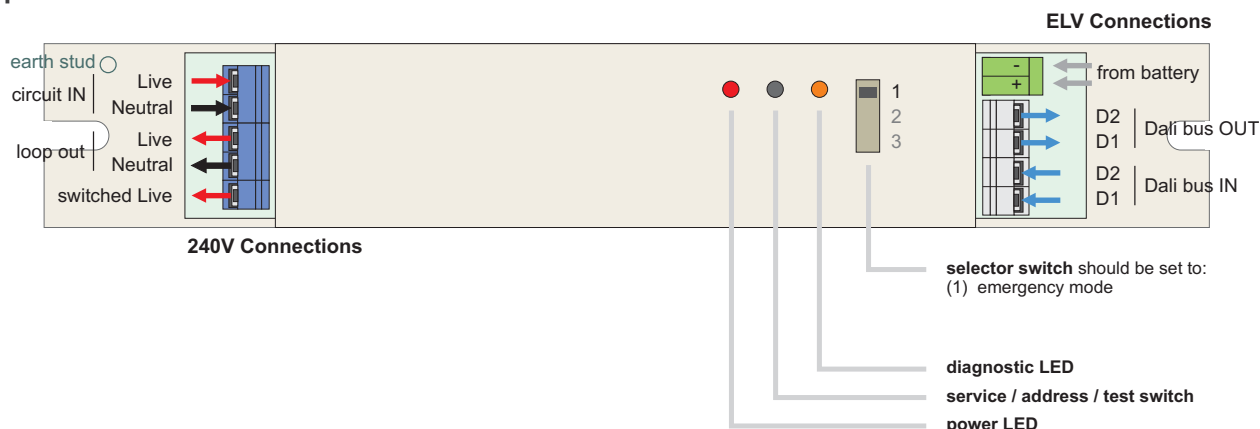
The unit connects to the Dali buswire which links Dali luminaires, sensors and other devices to the Dali lighting control module.

The unit derives its power from the incoming 230V circuit. Integral LEDs indicate power & diagnostic functions while a selector switch configures the relay for operating in emergency test mode (see emergency test & monitoring datasheet).



■ **dali emergency monitoring unit**
product ref: 208A1

product details



connection

The **dali emergency monitoring unit** is compatible with the complete range of Delmatic Dali modules and may connect to:

- the Dali bus from the **Dali Buswire module** which connects to Dali luminaires and Dali devices,
- the Dali bus on any or all of the twelve channels from the **Dali Broadcast module**,
- Dali outputs from **One Ten Six & Zero Twelve plug-in modules**

technical details

supply

1 x 220-240V~ 50/60Hz single phase 10A lighting circuit

switched output

1 x 16A switched output (max 1.5 sq.mm cable)

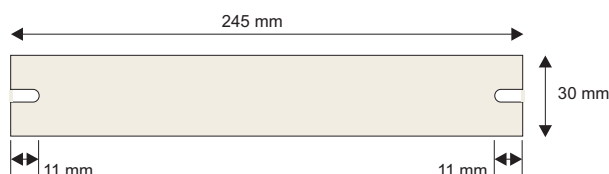
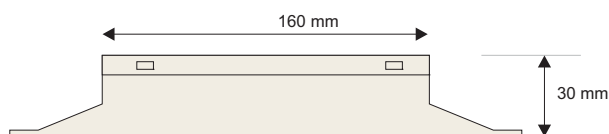
Dali bus inputs

2 plug-in ports (two-pin) for bus connection (max 1.5 sq.mm cable)

construction / ambient temp / relative humidity

metal enclosure / 0 to +50°C / 20% to 90% non condensing

dimensions and mounting details



delmatic metro one ten six plug-in module

The **metro one ten six** provides powerful and flexible control of lighting, total plug-in connectivity, distributed intelligence, and incorporates Lon technology for seamless interoperability with other Lon building services.

The module is equipped with ten individually addressed relays providing independent switching of up to ten outputs plus an emergency test output. Dimming modules provide analogue or Dali dimming while switching modules may be upgraded to dimming by inserting a dimming capsule.

The **metro one ten six** enables single or two-fix installation. A robust frame, designed for screw or drop-rod mounting, accepts a clip-in module with ports for the plug-in connection of incoming mains, switched & dimmed luminaire outputs, buswire & control devices. The module accepts the plug-in connection of multisensors, presence detectors and switches.



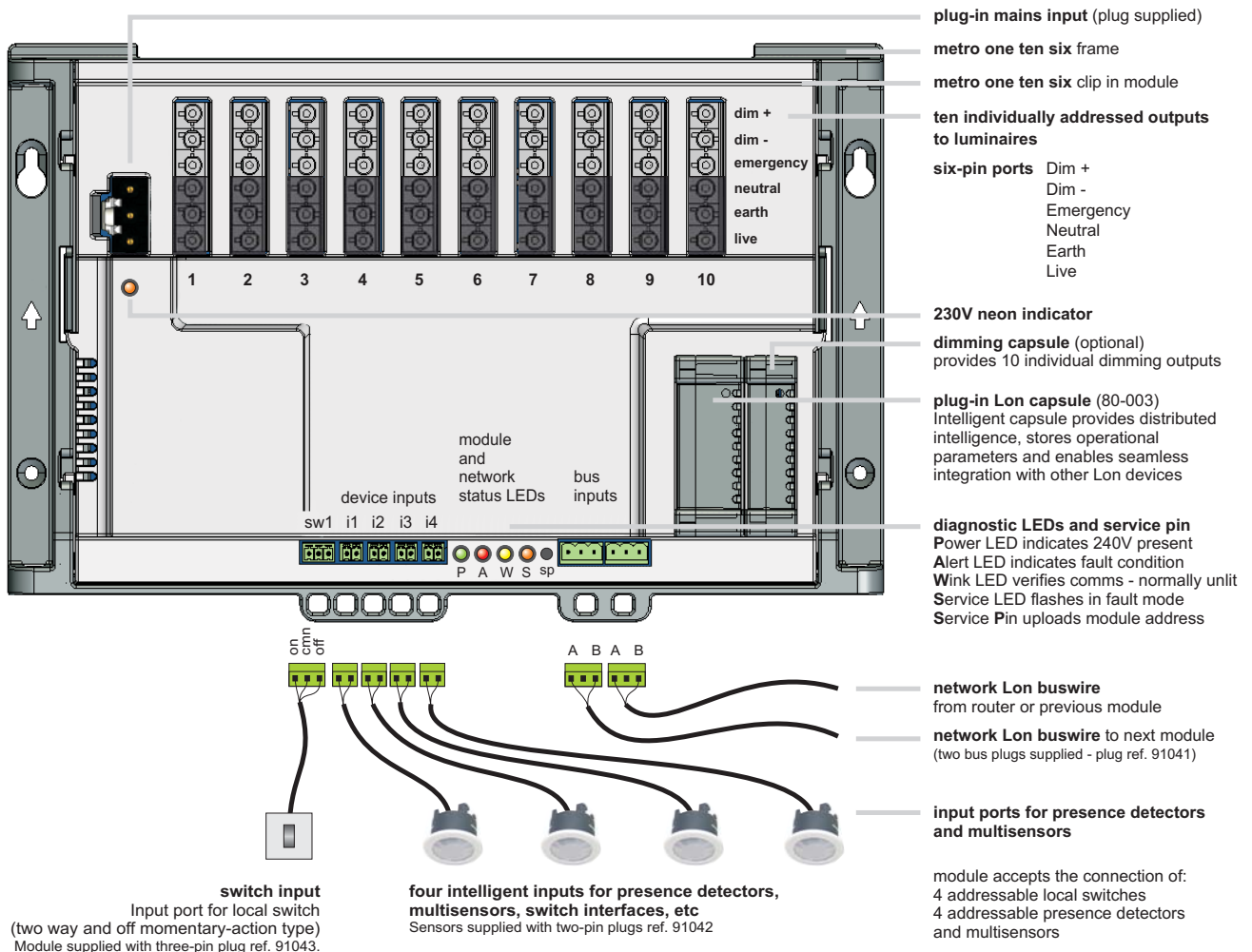
■ **metro one ten six switching**
product ref: **201A1**

Dali plug-in module also available - ref 201B1
see separate data sheet

■ **analogue upgrade capsule**
product ref: **80-005**
provides ten 1-10V outputs

■ **digital upgrade capsule**
product ref: **80-004**
provides ten DSI / Dali outputs

module features



delmatic metro one ten six plug-in module

mounting details

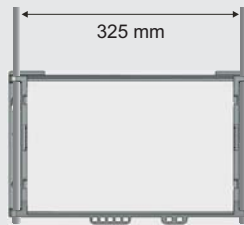
The **metro one ten** is designed for single or two-fix installation. The unit comprises:

- a robust frame fixed on drop rods or via screws
- a snap-in module.

mount the frame with the arrow pointing up

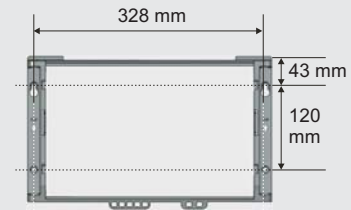
drop-rod mounting

8mm drop-rods at 325mm centres



screw mounting

4 M5 screws at 328 x 120mm centres



technical details

supply

1 x 220-240V~ 50/60Hz single phase 10A lighting circuit protected by 10A MCB (3 pin plug-in connector supplied)

switched 230V outputs

10 individually switched outputs (10A resistive, 3A inductive)
1 emergency test output

dimming outputs (with optional plug-in dimming capsule)

Analogue Upgrade Capsule (80-005) provides ten analogue 1-10V dimming outputs.

Digital Upgrade Capsule (80-004) provides ten DSI / Dali dimming outputs.

Dali ballasts do **not** require on-site addressing and module provides lamp/ballast failure per Dali output.

Dali emergency devices connect to the Dali bus from the luminaire port (requires Digital Capsule)

local switch inputs

1 plug-in port (three-pin - sw1) for connection of conventional monetary action switch.

4 plug-in ports (two-pin - i1-i4) for connection of smart / Dali presence detectors, multisensors and scene-set devices: plug-in terminal block accepts max 1 sq.mm cable.

network Lon bus inputs

2 plug-in ports for twisted pair Lon network bus connection (max 1.5 sq.mm cable).

diagnostic LEDs

Neon - shows 240v present.

Power LED - shows secondary power circuit operational.

Alert LED - indicates short on the sensor bus or issue with Communication card.

Wink LED - winks when instructed through software

Service LED - indicates fault mode.

buswire specification

330 V rms - twisted pair Belden 7701NH unshielded 22 AWG stranded.

600 V rms - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid.

dimensions (mm)

345 w x 210 h x 55 d (excludes plugs)
100 mm depth including capsule & plugs

construction

flame-retardant low smoke moulded housing

ambient temperature / relative humidity

0 to +50°C / 20% to 90% non condensing



Lon specifications

Echelon LonWorks FT 5000 Smart Transceiver
FTX3 free topology communications transformer
64k EEPROM

Conforms to LonMark 3.4 guidelines and profiles

4 switch objects #3200

4 light sensor objects #1010

4 occupancy sensor objects #1060

10 open loop actuator objects #0003

4 occupancy controller objects #3071

4 light controller objects #3050

plug details

mains input to module (plug supplied)

(Live, Earth, Neutral)

3 pole female plug with locking device

output to switched luminaires

(Live, Earth and Neutral)

3 pole plug without locking device

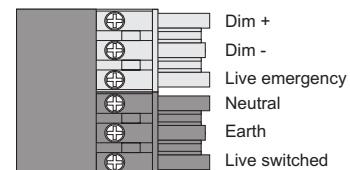
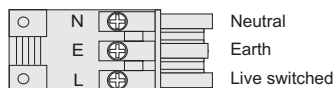
Wieland ref: 92.932.3053.1

output to dimmed & emergency luminaires

(Live, Earth, Neutral, Emergency L, Dim -, Dim +)

6 pole without locking device

Wieland ref: 34.362.0211.1



delmatic metro six six module

The **six six** module provides flexible addressable control of single & three-phase lighting and power circuits.

The module accepts up to six incoming circuits and is equipped with six addressed relays providing individual switching of up to six 20A outputs. Each output may control lighting or power and any relay may be configured to operate as an emergency test output.

The **six six** module incorporates distributed intelligence, non-volatile memory (which stores operational parameters) and contains mechanically-latched relays which remain in their last state in the event of control failure: fascia override switches enable manual on/off override of each relay output.

The module comprises a fully-assembled unit: the robust enclosure contains a mother board with terminals for live, neutral & earth cables, bus & local switch connections, and accepting a plug-in intelligent Lon capsule (for seamless interoperability with other building services).

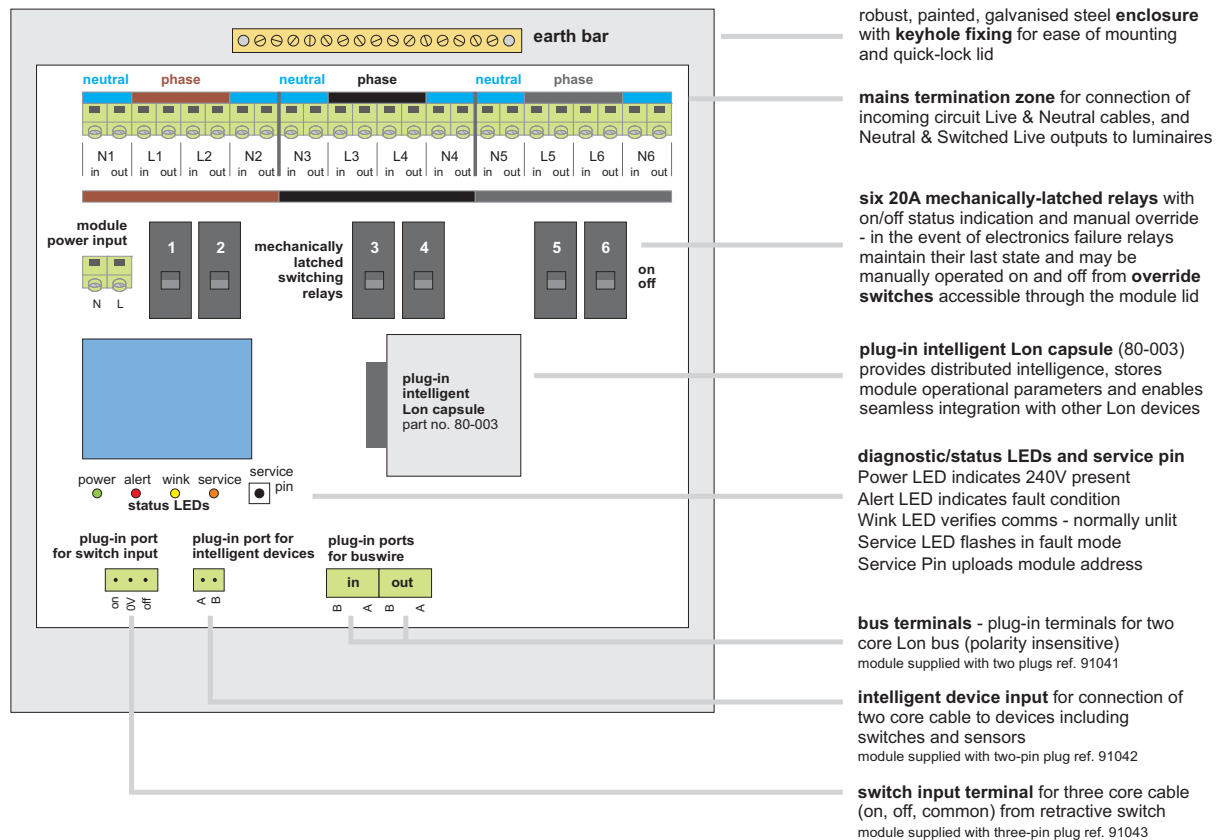


metro six six - switching

product ref: **210A1**

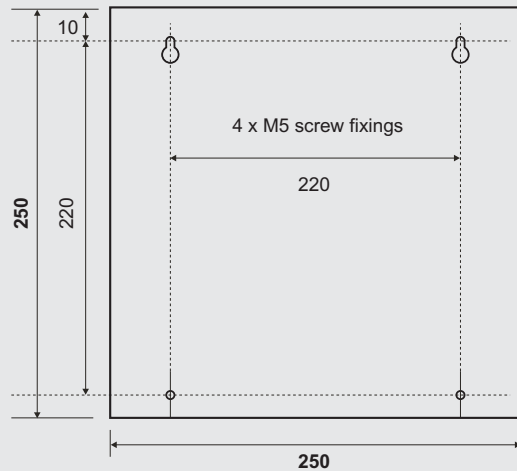
Provides six 20A switched outputs.

module features



delmatic metro six six module

mounting, installation and dimensions



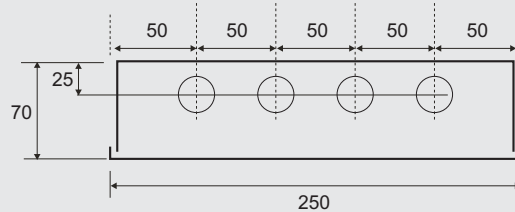
The module should be installed in an accessible location, ideally at a height of 1.5m from floor level.

The back box is mounted using four M5 screw fixings: the top two holes use keyhole fixings for ease of installation.

When mounting adjacent boxes leave 6mm fixing clearance.

All dimensions in millimetres.

Top and bottom sides contain 4 x 25mm conduit entry knockouts.



technical details

mains input

six 220-240V~50/60 Hz x 20 Amp single / three phase circuits - terminals accept 2 x 4 sq.mm cables

module power

module electronics powered from separate terminals: power may be taken from one of the incoming circuits

mains outputs

six individually addressed switched outputs via mechanically latched relay with status indication & manual override: loading per circuit 20A. terminals accept 2 x 4 sq.mm cables

local switch inputs

- switch input: module accepts connection of one standard momentary-action switch.
- smart switch input: module accepts connection of up to six smart switches and sensors on common buscable.
- smart bus plug-in terminal block accepts max 1 sq.mm cable. - smart bus cable maximum length - 100m.

Lon bus inputs

2 plug-in ports for two-core Lon bus connection - terminals accept 1.5 sq.mm cable.

buswire specification

- 330 V rms** - twisted pair Belden 7701NH unshielded 22 AWG stranded
- 600 V rms** - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

dimensions (mm)

250 w x 250 h x 70 d

construction

painted galvanised steel enclosure & lid to IP50 finished in RAL 7035 50% gloss

ambient temperature / relative humidity

0 to +50°C / 20% to 90% no condensation

Lon specifications

Echelon LonWorks FT 5000 Smart Transceiver
FTX3 free topology communications transformer
64k EEPROM

Conforms to LonMark 3.4 guidelines and profiles

6 switch objects #3200

6 open loop actuator objects #0003

6 occupancy sensor objects #1060

6 occupancy controller objects #3071

1 light sensor object #1010

1 light controller object #3050



delmatic metro twelve twelve module

The **twelve twelve** module provides flexible addressable control of single & three-phase lighting and power circuits.

The module accepts up to twelve incoming circuits and is equipped with twelve addressed relays providing individual switching and optional dimming of up to twelve 20A outputs. Each output may control lighting or power and any relay may be configured to operate as an emergency test output.

The **twelve twelve** module incorporates distributed intelligence, non-volatile memory (which stores operational parameters) and contains mechanically-latched relays which remain in their last state in the event of control failure: fascia override switches enable manual on/off override of each relay output.

The module comprises a fully-assembled unit: the robust enclosure contains a mother board with terminals for live, neutral & earth cables, bus & local switch connections, and accepting a plug-in intelligent Lon capsule (for seamless interoperability with other building services) and optional dimming capsule.



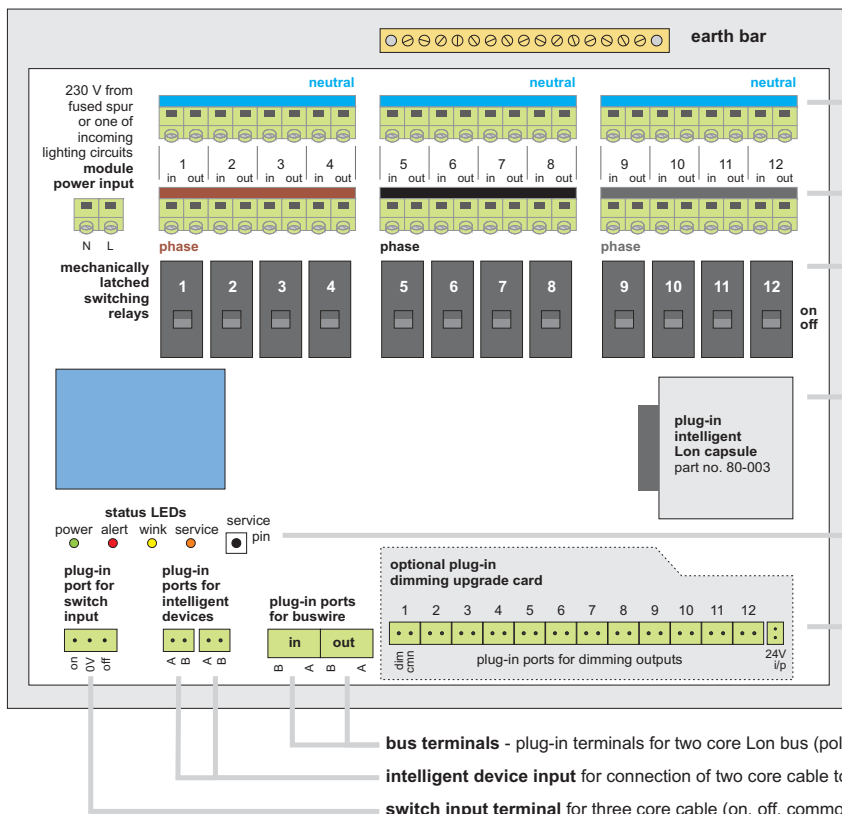
metro twelve twelve - switching

product ref: **202A1**

Provides twelve 20A switched outputs and contains port for dimming upgrade card.

- **optional analogue upgrade card** product ref: **80-007**
provides 12 analogue 1-10V outputs each controlling up to 20 luminaires
- **optional digital upgrade card** product ref: **80-006**
provides 12 DSI outputs each controlling up to 20 luminaires
- **optional phase dimming pod** product ref: **91024**
provides phase dimming of 750W lighting load

module features



- robust, painted, galvanised steel **enclosure** with **keyhole fixing** for ease of mounting and quick-lock lid
- **mains termination zone** for connection of incoming circuit Live & Neutral cables, and Neutral & Switched Live outputs to luminaires
- **twelve 20A mechanically-latched relays** with on/off status indication and manual override - in the event of electronics failure relays maintain their last state and may be manually operated on and off from **override switches** accessible through the module lid
- **plug-in intelligent Lon capsule** (80-003) provides distributed intelligence, stores module operational parameters and enables seamless integration with other Lon devices
- **diagnostic/status LEDs and service pin**
Power LED indicates 240V present
Alert LED indicates fault condition
Wink LED verifies comms - normally unlit
Service LED flashes in fault mode
Service Pin uploads module address
- **optional plug-in dimming card** provides twelve analogue (type 80-007) or digital (type 80-006) dimming outputs: contains terminals for connection of two core output to luminaire dimming ballasts
- **bus terminals** - plug-in terminals for two core Lon bus (polarity insensitive) (plug ref. 91041)
- **intelligent device input** for connection of two core cable to devices including switches and sensors (plug ref. 91042)
- **switch input terminal** for three core cable (on, off, common) from momentary-action switch (plug ref. 91043)

delmatic metro twelve twelve module

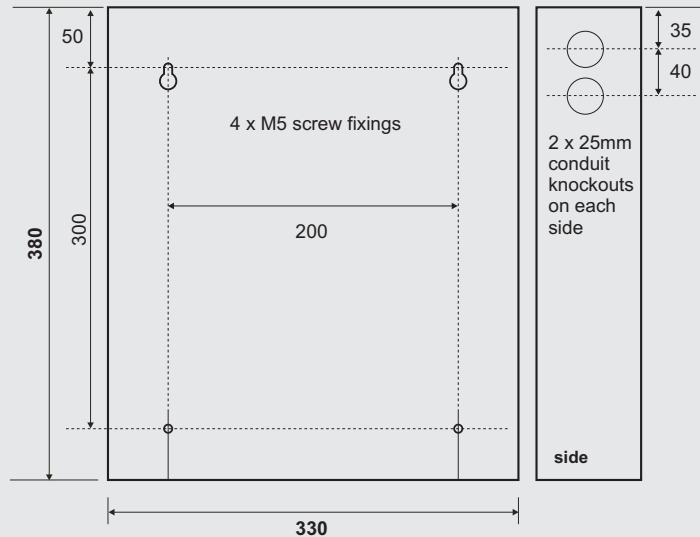
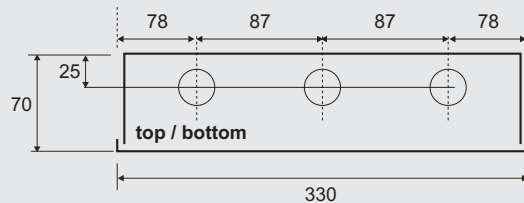
mounting, installation and dimensions

The module should be installed in an accessible location, ideally at a height of 1.5m from floor level.

The module is mounted using four M5 screw fixings: the top two holes use keyhole fixings for ease of installation. When mounting adjacent boxes leave 6mm fixing clearance.

All dimensions in millimetres.

Top/bottom sides contain 3 x 25mm conduit knockouts.
Left/right sides contain 2 x 25mm conduit knockouts.



technical details

mains input

twelve 220-240V~50/60 Hz x 20 Amp single / three phase circuits - terminals accept 2 x 4 sq.mm cables

module power

module electronics powered from separate terminals: power may be taken from one of the incoming circuits

mains outputs

twelve individually addressed switched outputs via mechanically latched relay with status indication & manual override: loading per circuit 20A. terminals accept 2 x 4 sq.mm cables

dimming outputs

with upgrade card 80-007 twelve **0-10V** dimming outputs linked to switching outputs - up to twenty analogue ballasts per output. plug-in screw-terminal ports accept max 1.5 sq.mm cable

with upgrade card 80-006 twelve **Dali/DSI** digital dimming outputs linked to switching outputs - up to twenty DSI digital ballasts per output. plug-in screw-terminal ports accept max 1.5 sq.mm cable

local switch inputs

- switch input: module accepts connection of one standard momentary-action switch.
- smart switch input: module accepts connection of up to twelve smart switches and sensors on common buscable.
- smart bus plug-in terminal block accepts max 1 sq.mm cable. - smart bus cable maximum length - 100m.

Lon bus inputs

2 plug-in ports for two-core Lon bus connection - terminals accept 1.5 sq.mm cable.

buswire specification

- 330 V rms** - twisted pair Belden 7701NH unshielded 22 AWG stranded
- 600 V rms** - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

dimensions (mm)

330 w x 380 h x 70 d

weight

4.4 kg

construction

painted galvanised steel enclosure & lid to IP50 finished in RAL 7035 50% gloss

ambient temperature / relative humidity

0 to +50°C / 20% to 90% no condensation

Lon specifications

- Echelon LonWorks FT 5000 Smart Transceiver
- FTX3 free topology communications transformer
- 64k EEPROM
- Conforms to LonMark 3.4 guidelines and profiles
- 12 switch objects #3200
- 12 open loop actuator objects #0003
- 6 occupancy sensor objects #1060
- 6 occupancy controller objects #3071
- 1 light sensor object #1010
- 1 light controller object #3050



delmatic metro hard wired DIN six six module

The **six six DIN** module provides flexible addressable control of single and three-phase lighting & power circuits.

The module accepts up to six incoming circuits and is equipped with six addressed relays providing individual switching (and optional dimming) of up to six 20A outputs. Each output may control lighting or power and any relay may be configured to operate emergency lighting.

The **six six DIN** incorporates distributed intelligence, non-volatile memory (which stores operational parameters) and contains mechanically-latched relays which remain in their last state in the event of control failure: integral override switches enable manual on/off override of each relay output.

The DIN-rail mounted module contains a Lon neuron for seamless interoperability with other building services, incorporates screw terminals for mains terminations, and plug-in terminals for bus and local switch connections.

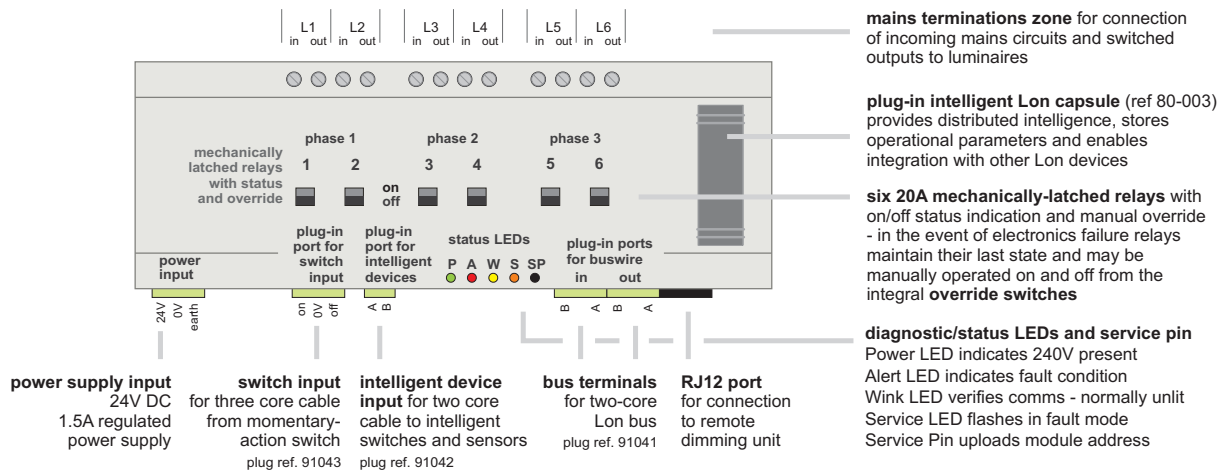


metro six six DIN

product ref: **203A1**

six 20A switched outputs with port for connection to optional dimming unit

module features



technical details

mains input

six 220-240V~50/60 Hz x 16 Amp single / three phase circuits.
terminals accept 2 x 4 sq.mm cables.

module power

module powered from separate 24V DC 1.5A power supply unit.

mains outputs

6 outputs (mechanically latched) with status & manual override.
loading per output 20A: terminals accept 2 x 4 sq.mm cables.

dimming option

module equipped with RJ12 port to drive remote dimming unit for combined switching and dimming operation.

local switch inputs

module accepts connection of one standard momentary-action switch, and up to six intelligent switches & sensors on common buscable.
smart bus plug-in terminal block accepts max 1 sq.mm cable.
smart bus cable maximum length - 100m.

dimensions (mm) 260 w x 90 h x 62 d

ambient temperature / relative humidity

0 to +50°C / 20% to 90% no condensation

buswire specification

330 V rms - twisted pair Belden 7701NH
unshielded 22 AWG stranded

600 V rms - twisted pair Belcom 4001P22S54LSZH
unshielded 22 AWG solid

Lon bus inputs

2 plug-in ports for two-core Lon bus connection.
terminals accept 1.5 sq.mm cable.

Lon specifications

Echelon LonWorks FT 5000 Smart Transceiver
FTX3 free topology communications transformer
64k EEPROM
Conforms to LonMark 3.4 guidelines and profiles



delmatic metro hard wired DIN twelve twelve module

The **twelve twelve DIN** module provides flexible addressable control of single and three-phase lighting & power circuits.

The module accepts up to twelve incoming circuits and is equipped with twelve addressed relays providing individual switching (and optional dimming) of up to twelve 20A outputs. Each output may control lighting or power and any relay may be configured to operate emergency lighting.

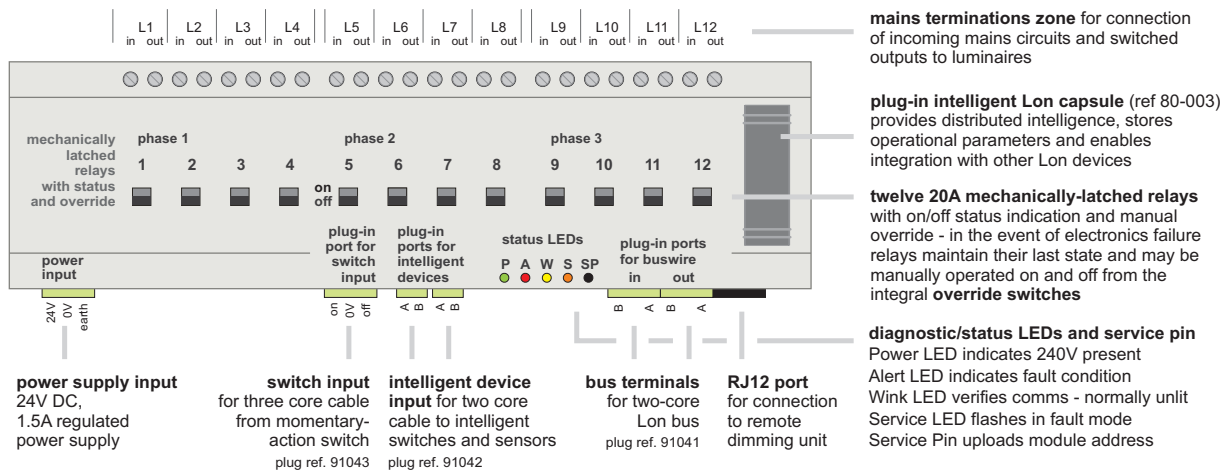
The **twelve twelve DIN** incorporates distributed intelligence, non-volatile memory (which stores operational parameters) and contains mechanically-latched relays which remain in their last state in the event of control failure: integral override switches enable manual on/off override of each relay output.

The DIN-rail mounted module contains a Lon neuron for seamless interoperability with other building services, incorporates screw terminals for mains terminations, and plug-in terminals for bus and local switch connections.



■ **metro twelve twelve DIN**
product ref: 209A1

module features



technical details

mains input

twelve 220-240V~50/60 Hz x 16 Amp single / three phase circuits. terminals accept 2 x 4 sq.mm cables.

module power

module powered from separate 24V DC 1.5A power supply unit.

mains outputs

12 outputs (mechanically latched) with status & manual override. loading per output 20A: terminals accept 2 x 4 sq.mm cables.

dimming option

module equipped with RJ12 port to drive remote dimming unit for combined switching and dimming operation.

local switch inputs

module accepts connection of one standard momentary-action switch, and up to twelve intelligent switches & sensors on common buscable. smart bus plug-in terminal block accepts max 1 sq.mm cable. smart bus cable maximum length - 100m.

dimensions (mm) 335 w x 90 h x 62 d

ambient temperature / relative humidity

0 to +50°C / 20% to 90% no condensation

buswire specification

330 V rms - twisted pair Belden 7701NH unshielded 22 AWG stranded

600 V rms - twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

Lon bus inputs

2 plug-in ports for two-core Lon bus connection. terminals accept 1.5 sq.mm cable.

Lon specifications

Echelon LonWorks FT 5000 Smart Transceiver
FTX3 free topology communications transformer
64k EEPROM
Conforms to LonMark 3.4 guidelines and profiles



delmatic metro analogue, DSI & phase dimming

Delmatic offer a range of DSI and analogue 1-10V options providing individual or group control and designed for plug-in or hard-wired installation.

Plug-in modules and **hard-wired modules** may be supplied with a dimming card / capsule providing analogue or digital dimming: the plug-in capsule approach enables switching modules to be upgraded easily from switching to dimming function.

36

1-10V analogue dimming

The **metro** range includes plug-in & hard-wired modules for dimming individual or groups of 1-10V analogue luminaires.

DSI digital dimming

The **metro** range includes plug-in & hard-wired modules for dimming individual or groups of DSI luminaires.

DSI is a proprietary protocol which lacks the addressing & feedback benefits of the open Dali protocol.

phase dimming

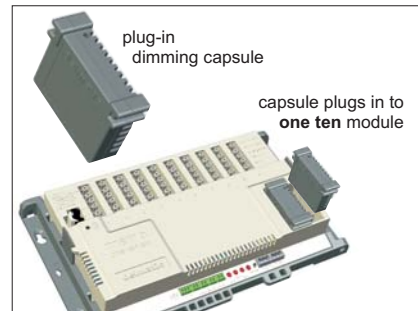
The **metro** range offers phase control (triac) dimming pods which are primarily used to dim tungsten and incandescent lighting.

plug-in modules - analogue and DSI dimming

The plug-in **one ten six** module accepts a plug-in capsule which upgrades the module operation to digital or analogue dimming: the dimming capsule provides ten individually addressed dimming outputs.

analogue upgrade capsule provides ten 1-10V outputs
product ref: **80005**

digital upgrade capsule provides ten DSI / Dali outputs
product ref: **80004**



hard-wired modules - analogue and DSI dimming

The hard-wired **twelve twelve** module accepts a plug-in card which upgrades the module operation to digital or analogue dimming: the dimming card provides twelve individually addressed dimming outputs each controlling up to twenty dimmable luminaires.

analogue upgrade card provides twelve analogue 1-10V outputs
product ref: **80007**

digital upgrade card provides twelve DSI outputs
product ref: **80006**



phase dimming - dimming pods

The **dimming pod** provides phase control of tungsten & incandescent lighting, and receives dimming signals from the **twelve twelve analogue** modules.

The pod provides flicker-free dimming across a load range of 60-750W at a temperature of 40°C at each dimmer: high-voltage halogen/incandescent lamps are also dimmable (60-500W). Pods feature reduced power losses, decreased self-heating as well as short-circuit, overload and over-temperature protection. Pods may be mounted adjacent to the module or near to controlled light fittings.

750W dimming pod product ref: **80020**



46 mm x 32 mm x 14 mm (h)

delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
sales@delmaticsaudi.com

delmatic metro RS232/485/DMX interface

The **RS 232 / 485 / DMX interface unit** seamlessly interfaces the lighting control network with other devices via RS 232, RS 485 or DMX protocols.

In **RS 232** mode, the interface receives and transmits signals between the lighting management modules and systems such as audio visual controls. Scene commands initiated by the AV system are received by the interface and activate preset lighting scenes & moods: scenes selected from Delmatic scene-set panels, infra-red transmitters, touchpads & touchpanels route via the interface to the AV system to trigger audio visual functions.

In **DMX** mode, the interface provides integrated control of DMX light sources enabling DMX lighting in front-of-house areas, meeting and conference rooms, and building façades etc to be controlled as part of the lighting management network, activated by switches, sensors and scene-set panels and configurable through the graphical head-end software.



metro RS232/485/DMX interface

product ref: 215A1 - RS 232 interface

product ref: 216A1 - DMX (485) interface

technical details

supply	1 x 220-240V~ 50/60 Hz single phase circuit to power module. (3 pin plug-in mains input connector supplied)
protection	module requires external protection by 10A MCB.
RS232 interface	9,600 Baud (maximum 57,600 Baud) ASCII protocol. one D-type port for RS232 connection.
RS485 interface	9,600 Baud (maximum 57,600 Baud) ASCII protocol. one 3-pin port for RS485 connection (max. 1.5 sq.mm cable).
DMX interface	250,000 Baud. one 3-pin port for DMX connection (max. 1.5 sq.mm cable).
Lon bus	2 plug-in ports for twisted pair Lon bus connection. (max. 1.5 sq.mm cable).
Lon cable	
330 V rms	twisted pair Belden 7701NH unshielded 22 AWG stranded
600 V rms	twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

dimensions (mm)

225 w x 133 h x 66 d

100mm depth including mains plug

construction

flame-retardant low smoke moulded housing

ambient temperature / relative humidity

0 to +50°C / 20% to 90% non condensing

mounting

The module is designed for wall or soffit mounting using four M5 screw fixings or two 8mm droprods.

Lon specifications

Echelon LonWorks FT5000 Neuron

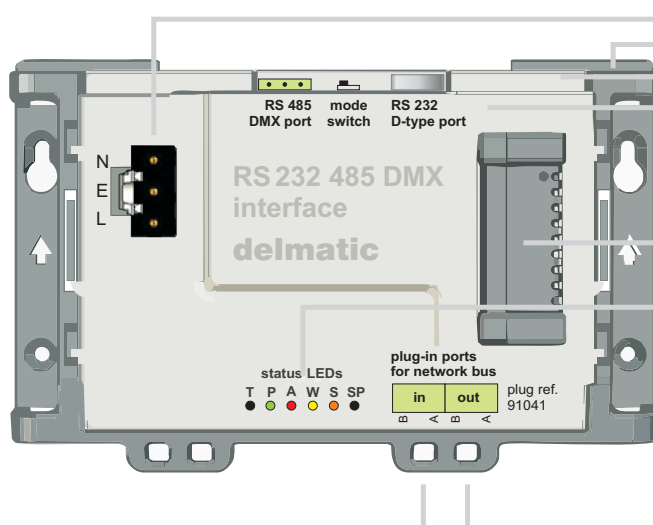
FTX3 free topology transceiver

64kb EEPROM

Conforms to LonMark 3.4 guidelines and profiles



module features



- plug-in mains input** (plug supplied with module)
- first-fix frame
- clip in module
- DMX / RS485 port**
3-pin port for DMX connection (max 1.5 sq.mm cable).
- RS 232 port**
one D-type port for RS232 connection.
- mode switch** selects RS232 or RS485/DMX mode
- plug-in intelligent Lon capsule** (80-003) provides distributed intelligence, stores operational parameters & enables seamless integration with other Lon devices
- diagnostic LEDs and service pin**
- Test pin** initiates test functions
- Power LED** - indicates module is powered up
- Alert LED** - bicolour LED indicate status and comms
- Wink LED** - winks when instructed by software
- Service LED** - lights when service pin pressed and flashes if module has no application software
- SP service pin** - uploads module address
- Lon bus** - plug-in terminals for connection of two core bus (from router or previous module & to next module).

delmatic metro Lon router

The **metro Lon router** forms part of the building-wide lighting management system architecture, ensures open and seamless communication across the horizontal & vertical networks and optimises the transmission of data.

The **Lon router** incorporates an LCD display and rotary selector provide password-protected access to features including master control, load-shedding and emergency-test routines, as well as network monitoring functions. The unit accepts direct inputs for master on and off control, loadshedding and emergency-test functions.

The **Lon router** accepts the connection of a lap-top or hand-held device for remote setting-up, configuring and monitoring of the network, includes integral network termination resistors and is designed using plug-in controls for ease of upgrade and maintenance.

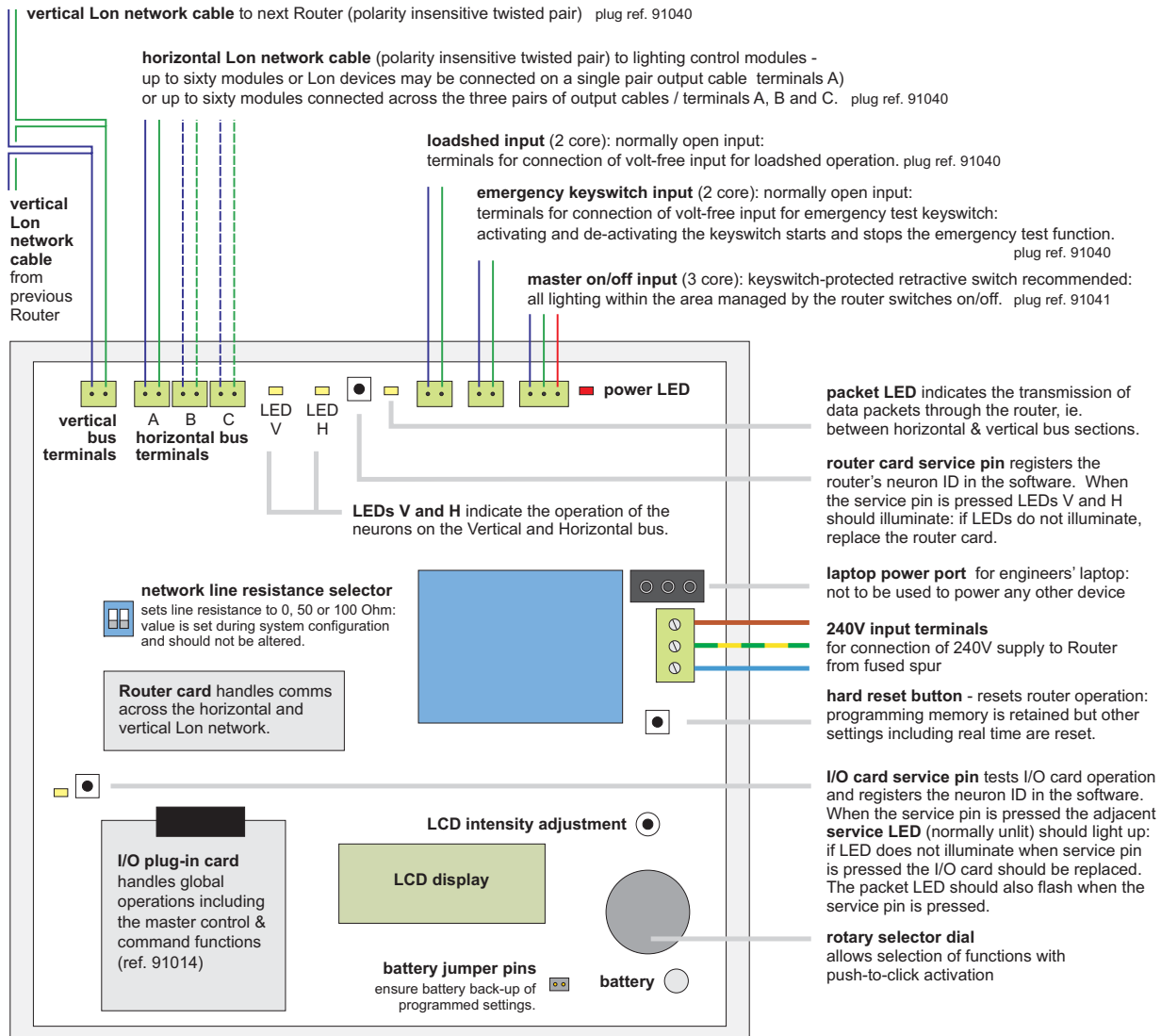
A **metro IP router** is also available for transmission of lighting management data across the IP network.



metro Lon router

product ref: 106A1

metro IP router also available - ref 106B1
see separate data sheet



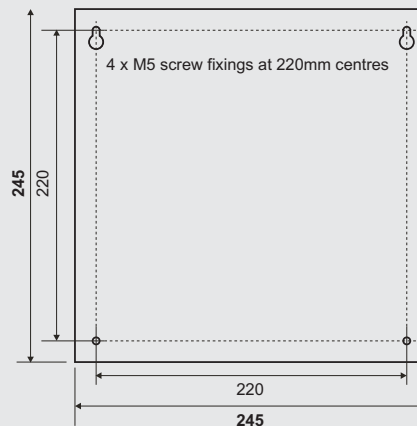
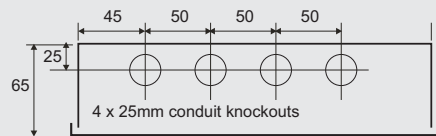
delmatic metro Lon router

mounting, installation and dimensions

The **metro router** should be installed in an accessible location, ideally at a height of 1.5m from floor level. The box is mounted using four M5 screw fixings at 220mm centres: the top two holes use keyhole fixings for ease of installation.

All dimensions in millimetres.

Top and bottom sides contain four 25mm knockouts for conduit entry.



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connectivity

- connects to vertical network bus which interlinks all routers via a free-topology twisted pair cable.
- connects to horizontal field bus which interlinks up to 60 lighting control modules served by the router via a free-topology twisted pair cable.
- accepts input connections for master on and off, loadshedding and e-test functions
- optional IP connectivity

technical details

mains input

1 x 220-240V~ 50/60Hz power supply

mains input connection

terminal block within module - max cable size 2.5 sq.mm

circuit protection

requires external protection by 3A fused spur

network capacity

supports up to 60 lighting control modules / devices - an in-line Metro Repeater may be used to increase the line capacity by a further 60 modules

network cable length

500m (maximum total free topology without repeater)

network connections

plug-in terminal connections - max cable size 1 sq.mm

buswire specification

330V rms

twisted pair Belden 7701NH unshielded 22 AWG stranded

600V rms

twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

dimensions (mm)

245 (w) x 245 (h) x 65 (d) - rotary dial projects by 15mm

housing / enclosure

painted galvanised steel enclosure finished RAL 7035

ambient temperature / relative humidity

0 to +50°C / 20% to 90% no condensation

power consumption - 3W

ELV inputs for

master on/off (all lighting on router domain)
emergency test keyswitch input (volt-free)
loadshed input (volt-free)

ELV input connections

plug-in terminal connections - max cable size 1 sq.mm

Lon interface

protocol: ANSI/EIA 709.1-A-1999 (LonTalk protocol)
transceiver: FTT-10A Transceiver
network: polarity insensitive
bus voltage: max 42.4 V DC

delmatic metro IP Lon router

The **ip router** forms part of the site-wide lighting management system and provides high-speed communication across the Ethernet/IP network.

IP communications are based on the ANSI IP852 standard for interoperable ANSI 709.1 to IP852 routers. The unit optimises the transmission of data and is designed for seamless integration into Lon networks supporting direct connection to LNS, LonMaker and Delmatic Lightscape™ software.

The **ip router** includes an on-board web server for remote configuration and includes service buttons for remote commissioning in normal or manual mode. An LCD display and rotary selector provide password-protected access to features including master control, load-shedding and emergency-test routines, as well as network monitoring functions. The unit accepts direct inputs for master on and off control, loadshedding and emergency-test functions.

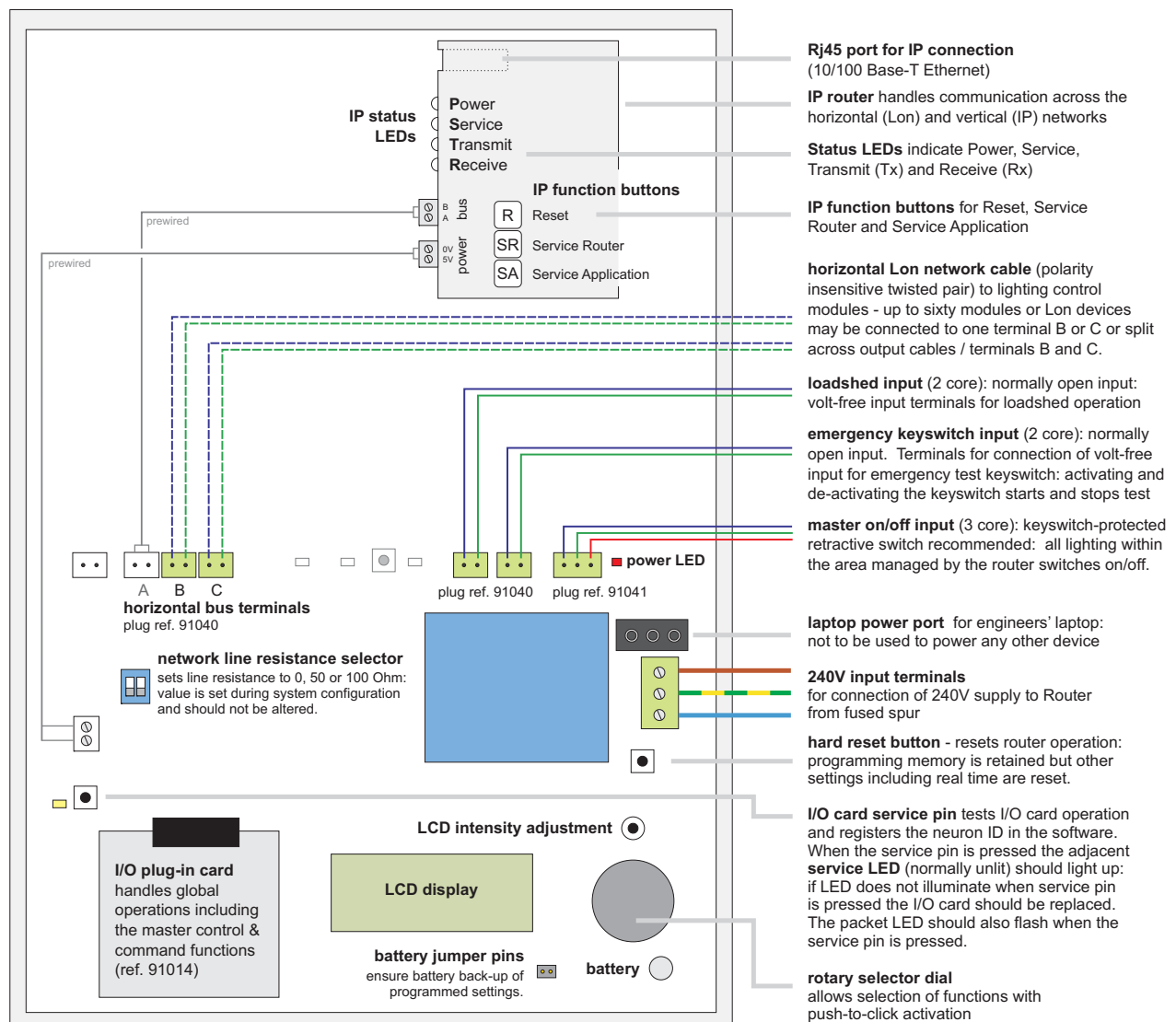
The **ip router** unit accepts the connection of a lap-top or hand-held device for remote configuration and monitoring, includes integral network termination resistors and uses plug-in electronics for ease of upgrade and maintenance.



metro ip router

product ref: **106B1**

metro router also available - ref 106A1
see separate data sheet



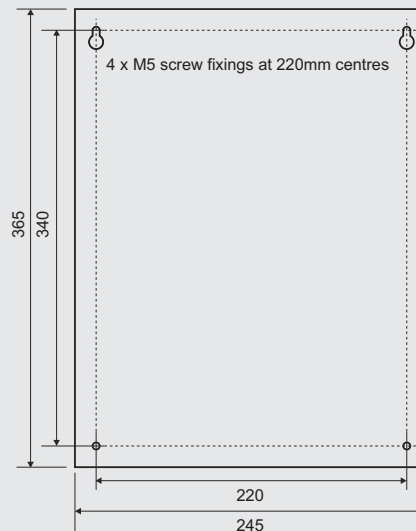
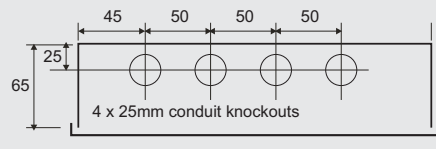
delmatic metro IP Lon router

mounting, installation and dimensions

The **metro router** should be installed in an accessible location, ideally at a height of 1.5m from floor level. The box is mounted using four M5 screw fixings at 220mm centres: the top two holes use keyhole fixings for ease of installation.

All dimensions in millimetres.

Top and bottom sides contain four 25mm knockouts for conduit entry.



connectivity

- connects to building IT network which interlinks all Delmatic metro routers.
- connects to horizontal field bus which interlinks up to 60 lighting control modules served by the router via a free-topology twisted pair cable.
- accepts input connections for master on and off, loadshedding and e-test functions

IP features

- Standard's based ANSI IP 852/709.1 Lon[®] over IP router
- Remote web configuration
- 10/100 Base T Ethernet and FT-10 connections
- Interoperates with LonMaker[™], i.Lon[®], Configuration Server and Coactive[™] Router-LL Configuration Server
- Remote firmware upgrades over IP connection

technical details

mains input

1 x 220-240V~ 50/60Hz power supply

mains input connection

terminal block within module - max cable size 2.5 sq.mm

circuit protection

requires external protection by 3A fused spur

network capacity

supports up to 60 lighting control modules / devices - an in-line Metro Repeater may be used to increase the line capacity by a further 60 modules

network cable length

500m (maximum total free topology without repeater)

network connections

plug-in terminal connections - max cable size 1 sq.mm

buswire specification

330V rms

twisted pair Belden 7701NH unshielded 22 AWG stranded

600V rms

twisted pair Belcom 4001P22S54LSZH unshielded 22 AWG solid

dimensions (mm)

245 (w) x 365 (h) x 65 (d) - rotary dial projects by 15mm

housing / enclosure

painted galvanised steel enclosure finished RAL 7035

ambient temperature / relative humidity

0 to +50°C / 20% to 90% no condensation

power consumption - 3W

ELV inputs for

master on/off (all lighting on router domain)
emergency test keyswitch input (volt-free)
loadshed input (volt-free)

ELV input connections

plug-in terminal connections - max cable size 1 sq.mm

Lon interface

protocol: ANSI/EIA 709.1-A-1999 (LonTalk protocol)
transceiver: FTT-10A Transceiver
network: polarity insensitive
bus voltage: max 42.4 V DC

IP telephone control



IP telephone interface

product ref: 126B1

IP telephone control enables individuals to switch and dim lighting from their telephone as well as control temperature, window blinds and other services.



A Metro IP Telephone interface server connects to the building IT network and monitors lighting commands entered into the IP telephones. The unique IP address of each telephone is matched through an online database to lights in the area so that users do not need to enter a location-related or other specific code.

From the IP telephone function buttons, lighting may be switched on or off, set to a user-preferred lighting level or dimmed up and down.

Metro IP telephone is:

- easy to implement
- can be configured for all phones
- offers instant response
- suitable for hot desk applications
- future proof

The IP telephony facility comprises hardware & software.

Hardware

An **IP Telephone interface server** connects to the IP network and communicates with the Delmatic head-end PC and lighting control modules.

Software

The **Metro IP Telephone software** on the head-end PC enables drag-and-drop matching of phone IP addresses to groups of lights.

Metro IP Phone browser software allows individuals to switch and dim lighting from their IP phone.

web browser control



web browser server

product ref: 138A1

Web browser control enables individuals to switch and dim lighting from their PC desktop as well as control temperature, window blinds and other services.



A Metro Web browser interface server connects to the building IT network and monitors lighting commands entered via desktop PCs. The unique IP address (MAC address) of each workstation is matched through an online database to lights in the area so that users do not need to enter a location-related or other specific code.

Function button icons and slider bars on the PC desktop enable lighting to be switched on or off, set to a user-preferred lighting level or dimmed up and down.

IP web browser control is:

- easy to implement
- can be configured for all workstations
- offers instant response
- suitable for hot desk applications
- future proof

Web browser control comprises hardware & software.

Hardware

A **web browser server** connects to the IP network and communicates with the Delmatic head-end PC and lighting control modules.

Software

The **Metro Web Browser software** on the head-end PC enables drag-and-drop matching of PC IP addresses to groups of lights.

Metro Web Browser software allows individuals to switch and dim lighting from their PC desktop.

delmatic metro infra-red transmitter

The **infra-red transmitter** provides user control of multiple lighting levels and scenes as well as integrated control of other services including window blinds and audio-visual controls.

The high-quality cast aluminium body incorporates organic curves for style and comfort, as well as tactile grip zones and soft touch pads.

The device is fully configurable and provides control of five lighting scenes with a master raise/lower facility.

The transmitter sends lighting level and scene selections to a ceiling-mounted **multisensor** and can work in parallel with **scene set panels** which incorporate an infra-red receiver for remote selection of lighting scenes.



personal infra red transmitter

product ref: 160A1

features

- cast aluminium body
- master raise and lower functions
- five scene selector buttons



dimensions

length	138 mm
width	48 mm
depth	25 mm

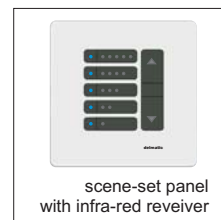
power

The transmitter is powered by two type N 1.5V batteries

scene-set panels and multisensor

The **infra-red transmitter** sends commands to a **scene-set panels** (with integral infra-red receiver) and/or to a ceiling-mounted **multisensor**.

The multisensor enhances energy-efficiency through its integral motion detector (configurable for presence or absence detection) and photocell sensor which add presence-related control of lighting and HVAC & daylight-linking to the overall control package.



touchpad and touchpanel

The **infra-red transmitter** forms part of the metro range of user control devices including the innovative new 10" **touchpanel** and 3.5" **touchpad** which provide user control and adjustment of multiple services including lighting, window blinds & temperature set-point, as well as the selection of lighting scenes and audio-visual functions.



delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
sales@delmaticsaudi.com

delmatic metro touchpad

The **touchpad** provides user control and adjustment of lighting and lighting scenes, as well as other services including audio-visual functions, window blinds and temperature set-point: an integral sensor measures the room temperature at desk level avoiding the need for wall-mounted sensors.

The **touchpad** combines a precision cast aluminium body with glass 3.5" LCD display, stand-by mode with wake-up button, and integral USB charging port.

The **touchpad** incorporates context-sensitive graphical screens to provide intuitive operation and a wide choice of software configurable functions.

The **touchpad** transmits infra-red data to a ceiling-mounted **multisensor**. The multisensor enhances overall control through its integral motion detector (configurable for presence or absence detection) and photocell sensor which add presence-related control & daylight-linking to the overall control package.



touchpad

product ref: 116B2

features

- 3.5" LCD touchscreen
- Real-time lighting level, temperature & set-point display
- Integral room temperature sensor
- Infra-red communication avoids buswires & installation
- Internal rechargeable battery
- USB charging port
- Software configurable through USB port



dimensions

width	110 mm
depth	95 mm
height	35 mm

multisensor

The **touchpad** transmits infra-red data and commands to a ceiling-mounted **multisensor**.

The multisensor enhances energy-efficiency through its integral motion detector (configurable for presence or absence detection) and photocell sensor which add presence-related control of lighting and HVAC & daylight-linking to the overall control package.



multisensor

delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
sales@delmaticsaudi.com

delmatic metro touchpanel

The **touchpanel** provides user control and adjustment of lighting and other services via a stunning glass touchpanel user interface.

The 10" touchpanel provides high-resolution graphics while backlighting ensures images are sharp, vivid and bright. The ultra-slimline fascia appears to float against the wall and shuns the obtrusive frames seen on so many touchscreen devices.

Swipe control enables users to flip from one function to another, effortlessly controlling lights and lighting scenes, as well as other services including blinds, temperature setpoint, and integrated AV functions.

Context-sensitive graphics provide intuitive operation and a wide choice of software configurable functions. The **touchpanel** may be configured to dim or "switch off" in sleep mode yet wakes instantly upon touch activation.

The **touchpanel** connects to the Dali network and transmits user commands via the Dali network or via Lon to other interoperable building services devices.

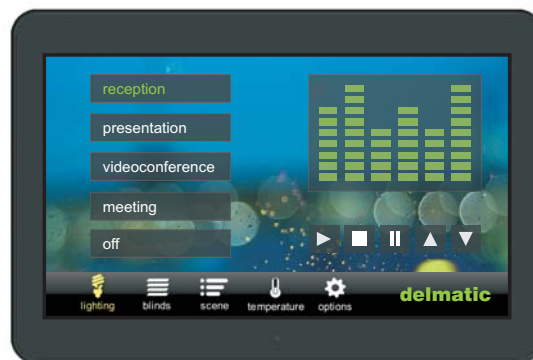


touchpanel

product ref: **230A1**

features

- 10" TFT LCD touchscreen
- 800 x 480 RGB resolution
- dimmable backlighting
- fully configurable graphical screens and functions
- automatic dim function
- automatic screen saver function
- switchable button beep
- scalable graphics
- import function of .bmp, .png, .jpg and .gif formats
- animation functions for graphical object animation.
- Dali connection
- 24V operation



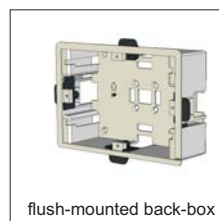
The **touchpanel** is fully software configurable and can include custom graphics and logos, multiple function sub-menus as well as configuration options and user preferences.

dimensions and mounting

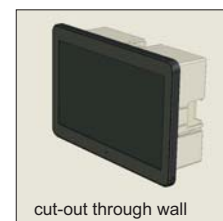
	touchpanel fascia	backbox cutout
width	258 mm	212 mm
height	170 mm	146 mm
depth	10 mm (in front of wall)	70 mm (behind wall)



clip-on touchpanel



flush-mounted back-box



cut-out through wall

delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
sales@delmaticsaudi.com

delmatic metro Dali scene set panel

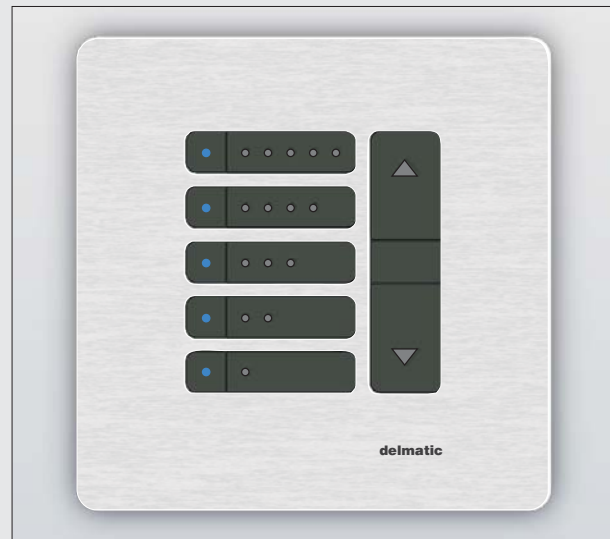


The **scene set panel** provides control of programmed lighting scenes and integrated functions including blinds & audio-visual equipment.

The panel allows selection of five lighting scenes, while master raise and lower function buttons enable the global level of the selected scene to be raised or lowered to suit occupant preferences.

Scenes are fully configurable through graphical software and may be actioned locally from the scene set panel, activated automatically based upon timed schedule or daylight levels, or manually through the head-end software: the scene set panel indicates the current lighting scene irrespective of whether this has been selected locally or centrally.

The contemporary design comprises a clip-on fascia, soft-touch pads with blue LEDs indicating the current scene, and an integral infra-red receiver enabling remote selection of scenes from a personal infra-red transmitter or touchpad.

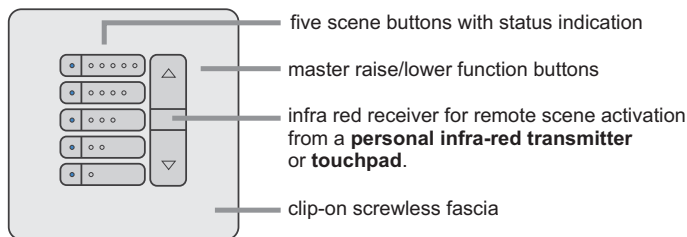


■ scene set panel

product ref: **123C2**

46

features



scenes may be remotely activated using an optional hand held **infra red transmitter** or desktop **touchpad**.



dimensions and technical details

fascia panel	86mm x 86mm
depth	depth behind wall - 25mm fits single-gang 35mm box (not supplied)
cable specification	connects via two-core cable as Belden 7701NH unshielded twisted pair <small>Supplied with two-pin plugs ref. 91042</small>

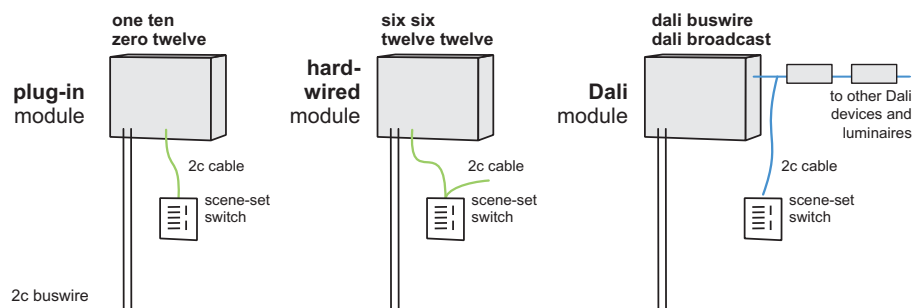
finish

The standard panel finish is brushed self-colour aluminium with soft-touch buttons.

Alternative panel finishes are available to special order.

installation

The **scene set panel** can connect to any type of module, plugging into **One Ten Six** and **Zero Twelve** modules, connecting to the control bus from **Six Six** and **Twelve Twelve** hard-wired modules, or wiring directly onto the Dali bus from **Dali Buswire** modules.



delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
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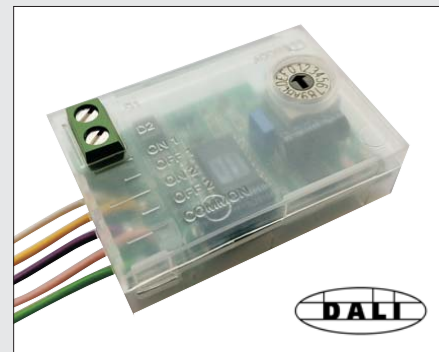
delmatic metro Dali switch interface



switch interfaces enable standard momentary-action (two-way-and-off retractive) switches to be converted into system switches or Dali switches: in this way, system switches and Dali switches can have the same plate finish as other electrical accessories in the building.

Dali switch interfaces enable two independent switches to be connected to a shared buswire and avoid the need to wire individual switches back to multiple input points. The switch interfaces also connect to the shared Dali buswire which links Dali ballasts, Dali presence detectors and multisensors and Dali emergency devices, reducing the extent of wiring on a project.

The **switch interface** comprises a compact electronic device that fits within a switch backbox and connects to the switch terminals and to the smart/Dali bus. Switching and dimming actions at the switch are converted into commands which are transmitted to the lighting management network.

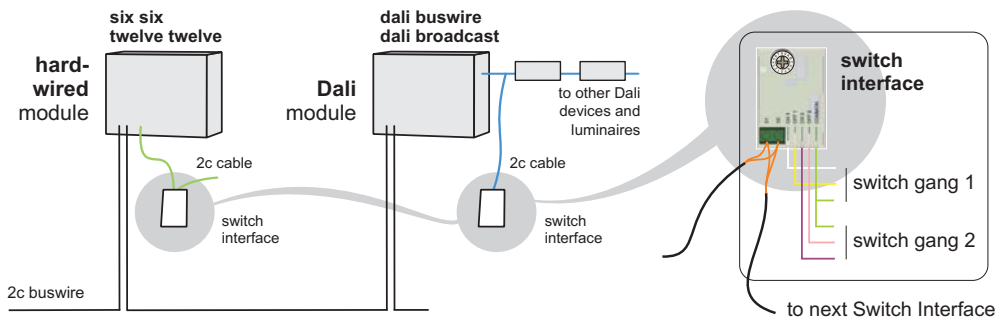


■ **dali switch interface**
product ref: 119A1

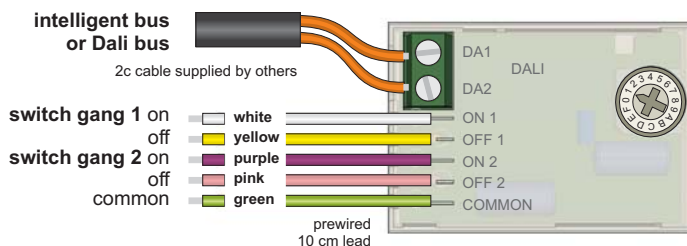
installation

Within core areas, **switch interfaces** typically connect along a shared buswire to an input at a hard-wired **six six** or **twelve twelve** module: **switch interfaces** avoid the need to wire individual switches back to multiple input points.

As part of a Dali network **dali switch interfaces** connect to the shared Dali buswire which also links Dali ballasts, Dali presence detectors and multisensors and Dali emergency devices.



wiring



configuration

The rotary dial allows the interface to be set to up to sixteen addresses, 1-9 plus 10(A), 11(B), 12(C), 13(D), 14(E), 15(F) & 16(0).



When used with a two-gang switch, setting the dial to one number assigns that address to gang 1 and the next address to gang 2: eg. setting the dial to 3 sets gang 1 to address 3 & gang 2 to address 4.

dimensions 46 mm x 32 mm x 14 mm (h)

Parallel or two-way operation is achieved by setting two interface units to the same address.

delmatic metro Dali sensors



Dali sensors maximise energy-efficiency by relating lighting to occupation and the amount of daylight contribution.

Delmatic's Dali sensors provide passive infra-red presence detection, absence detection, and daylight-linking, accept switching, dimming & scene commands via an integral infra-red receiver, and can accept temperature and set-point data for integrated control of HVAC and enhanced energy-efficiency.

The sensors are designed for total versatility in installation, and can connect to plug-in modules, daisy-chain on a common bus, and wire directly to a Dali buswire, saving materials, time and money.



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dali multisensor

product ref: **164A1**

The **dali multisensor** optimises energy-efficiency by combining passive infra-red presence / absence detection with daylight linking so that lighting is related to both occupancy and daylight.

The multisensor is fully software-configurable and may be set to operate in **presence** or **absence** detection mode: the presence detector time-out is software-adjustable while default illumination levels, photocell thresholds and other parameters are fully configurable.

The multisensor includes an infra-red receiver that enables users to adjust lighting levels using an **infra-red transmitter**, and accepts lighting, blind, temperature & set-point data from **touchpads** so lighting, heating & cooling are linked to occupancy.



dali presence detector

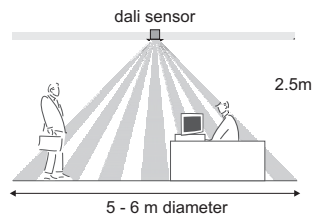
product ref: **163A1**

The **dali presence detector** saves energy by relating lighting to occupation and switching lighting off in vacated areas.

The detector is software-configurable to operate in **presence mode** (switching lights on when motion is sensed and off after the area is vacated) or **absence mode** (with lighting manually energised by switch, transmitter, phone or web-browser, and switched off after the area is vacated): the time-out is also software configurable with a default of fifteen minutes.

detection field

The sensor provides a circular detection field with a diameter typically twice the mounting height.



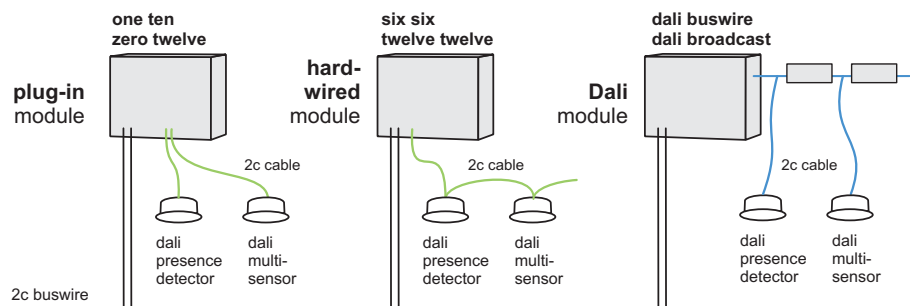
dimensions

height above ceiling	35 mm
projection below ceiling	5 mm
body diameter	39 mm
bezel diameter	49 mm
cut-out diameter	40 mm

installation

Dali sensors can plug into **One Ten Six** and **Zero Twelve** modules, connect to the local control bus from **Six Six** and **Twelve Twelve** hard-wired modules, or wire directly onto the Dali bus from **Dali Buswire** and **Dali Broadcast** modules.

Sensor supplied with 2 x two-pin plugs ref. 91042



delmatic
www.delmatic.com

London, UK
+44 (0) 20 8987 5900
delmatic@delmatic.com

Dubai, UAE
+971 (0) 4 2566 722
sales@delmaticarabia.ae

Doha, Qatar
+974 4452 8226
sales@delmaticqatar.com

Riyadh, Saudi Arabia
+966 (0)1 211 8170
sales@delmaticsaudi.com

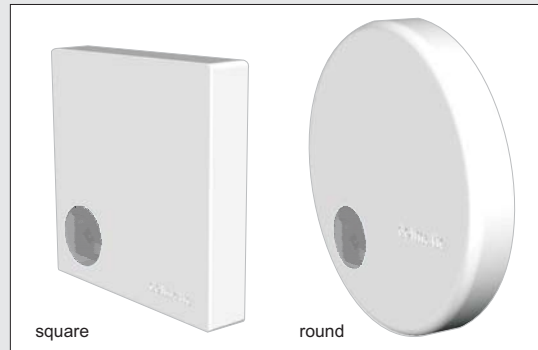
delmatic metro Dali microwave sensors



microwave sensors achieve energy-savings by relating lighting to occupation and the extent of daylight.

The **microwave sensors** provide motion detection within an extended area and incorporate a highly sensitive detector which emits low power microwave signals & measures the reflections as the signals bounce off moving objects.

The sensors connect to plug-in modules, daisy-chain on a common bus or connect direct to the Dali bus. For ease of installation, the sensor derives its power from the module or buswire to which it connects, avoiding the need to provide a 230V connection.



microwave presence detector

product ref: **165M1**

The **microwave presence detector** achieves energy savings by relating lighting to occupation and switching lighting off in vacated areas.

The detector is software-configurable and may be set to **presence mode** (switching lights on when motion is sensed and off after the area is vacated) or **absence mode** (with lighting manually energised by a switch etc) and switched off once the area is vacated): the time-out is also software configurable with a default of fifteen minutes.

The microwave presence detector is supplied with interchangeable square and round clip-on fascias.

microwave multisensor

product ref: **166M1**

The **microwave multisensor** provides enhanced energy-efficiency by combining infra-red presence / absence detection with daylight linking so lighting is related to both occupancy and daylight.

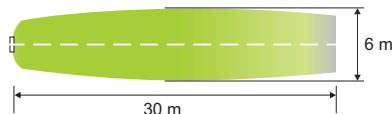
The multisensor operation is fully software-configurable including selection of presence or absence mode, time-out period & photocell sensitivity thresholds.

The multisensor also incorporates an infra-red receiver which receives switching and dimming commands from **personal infra-red transmitters**.

The microwave presence detector is supplied with interchangeable square and round clip-on fascias.

detection field

The sensor provides a linear detection field of 30 metres length by 6 metres width.



Note: unit is very sensitive at maximum setting and may detect motion through thin walls or partitions.

dimensions

fascia	round	square
controls - width x height	125 mm	100 x 100 mm
depth (front) from wall	80 x 80 mm	
depth within wall	20 mm	
	25 mm	

Mounts to UK standard single-gang 40mm depth flush box (not supplied)

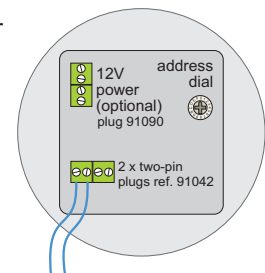
installation

The sensor should be wall mounted at a height of 1.2m to 1.5m. The sensor should not be located on a vibrating surface or within 1m of any lighting or ventilation equipment and should be sited as far away as possible from the surface of metal objects.

The sensor can connect to the local control bus from **Six Six** and **Twelve Twelve** hard-wired modules, or wire directly onto the Dali bus from **Dali Buswire & Dali Broadcast** modules.

wiring connections

The sensor obtains its power from the module to which it connects: if more than two microwave sensors are connected on a shared buswire, additional power must be provided using a 12V PSU wired to the sensor.



2c to lighting control module or shared/Dali bus

delmatic emergency light testing & monitoring

Delmatic systems enable testing and monitoring of the entire emergency lighting installation in a building including within areas such as plant rooms where lighting is not typically controlled via the lighting management system.

Delmatic Lightscape graphical software provides comprehensive testing and monitoring of emergency lighting, and data including lamp, ballast and battery performance is recorded and logged for maintenance and statutory purposes. Tests may be initiated from the PC with the time, date and duration of the test logged as well as additional information including premature termination of a test: tests may also be programmed to operate at intervals and durations specified within EN 50172 or initiated from routers or programmed keyswitches.



Delmatic systems provide emergency light testing and monitoring of third-party intelligent Dali emergency invertors including EmPros as well as Delmatic emergency photocell and battery monitoring units.

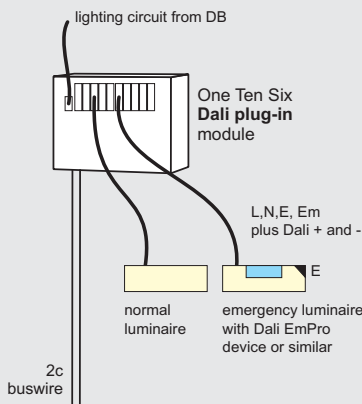
testing & monitoring of emergency lights available with Dali monitoring devices

Dali emergency devices such as EmPros (supplied by others) are available for most fluorescent luminaires as well as for other sources such as LEDs (irrespective of whether the luminaire itself is fitted with a Dali ballast): Delmatic systems provide emergency light testing and monitoring of these Dali emergency devices.

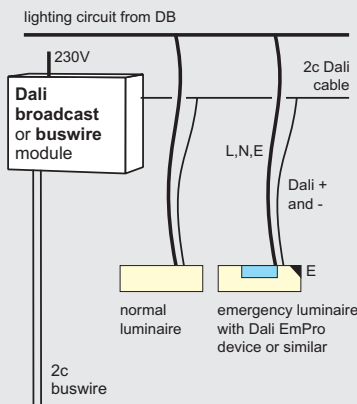
The Dali emergency devices connect to the two core (Dali) buswire from a Delmatic Dali Plug-in, Dali Buswire or Dali Broadcast module allowing comprehensive monitoring through the head-end graphical software. Delmatic's emergency monitoring software tracks a range of information related to the emergency fitting including battery charge, discharge, test performance etc, which is recorded for analysis and statutory logging.

Lighting within plant rooms and similar areas is traditionally not controlled by a lighting management system and switched locally by 230V switches: however emergency lighting within these areas can now be tested and monitored as an integral part of the Delmatic lighting management system.

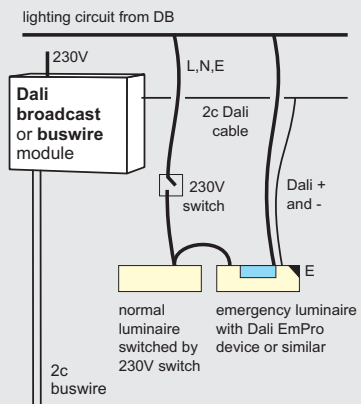
Plug-in module providing control of normal & emergency lamps & testing/monitoring of emergency lamp



Buswire / broadcast module providing control of normal & emergency lamps & testing/monitoring of emergency lamp



Buswire / broadcast module providing testing/monitoring of emergency lamp only



The **emergency photocell monitoring unit** monitors the emergency lamp output and is used with a lighting control module equipped with an emergency-test relay controlling the maintained feed to the battery pack.



Upon receipt of a test command, the emergency-test relay at the module opens, causing a loss of maintained feed to the battery such that the emergency lamp is powered from the local battery: the **photocell unit** monitors the lamp output and transmits pass/fail data via the module to the network PC for analysis and logging.

product ref: **113A3**

The **emergency battery monitoring unit** provides self-contained testing and monitoring via the integral emergency-test relay which controls the maintained feed to the battery pack.



Upon receipt of a test command, the integral emergency-test relay opens, causing a loss of maintained feed to the battery such that the emergency lamp is powered from the local battery: the unit monitors the battery output for the duration of the test and transmits pass/fail data via the module to the network PC for analysis and logging.

product ref: **208A1**

testing & monitoring of emergency lights **not** available with Dali monitoring devices

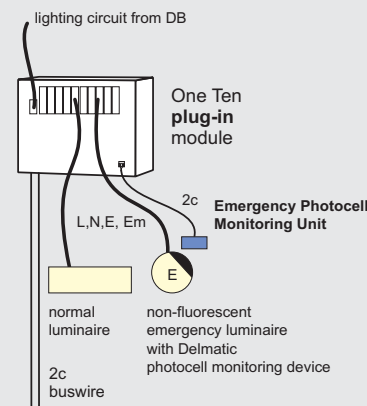
The Delmatic range includes emergency photocell and emergency battery monitoring units to test and monitor emergency light sources which are not available with Dali monitoring devices.

The **emergency photocell monitoring unit** works in conjunction with the emergency-test relay within a lighting control module which switches the maintained feed to the battery pack. The **emergency battery monitoring unit** is used with fittings which cannot house a photocell device and is equipped with an integral emergency-test relay.

Upon receipt of an emergency-test command, the emergency-test relay opens, causing a loss of maintained feed to the battery such that the emergency lamp is powered from the local battery: the photocell monitoring unit measures the lamp output transmitting pass/fail data via the module to the network PC for analysis and logging: the battery monitoring unit monitors the battery output and transmits pass/fail data to the network PC.

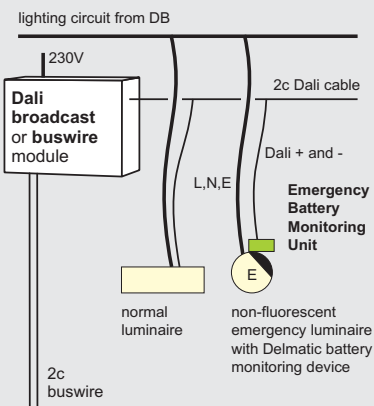
Plug-in module providing control of normal & emergency lamps & testing/monitoring of emergency lamp not available with Dali monitoring device

The example shows a photocell monitoring unit mounted on the fitting: the emergency test relay within the module controls the "maintained" feed to the inverter pack.



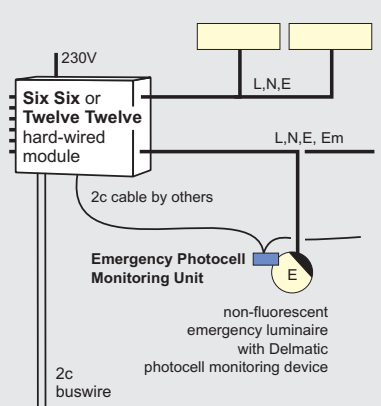
Buswire / broadcast module providing control of normal & emergency lamps & testing/monitoring of emergency lamp not available with Dali monitoring device

The example shows a battery monitoring unit which contains the emergency test relay required to control the "maintained" feed to the inverter pack.



Hard-wired Six Six or Twelve Twelve module providing control of normal & emergency lamps & testing/monitoring of emergency lamp

The example shows a photocell monitoring unit mounted on the fitting: the emergency test relay within the module controls the "maintained" feed to the inverter pack.



Delmatic parking guidance provides advanced monitoring and management of parking bays, and acts as an electronic valet which guides customers from the carpark entrance to available parking spaces: systems provide user convenience as well as environmental benefits through reduced pollution and extraction requirements.

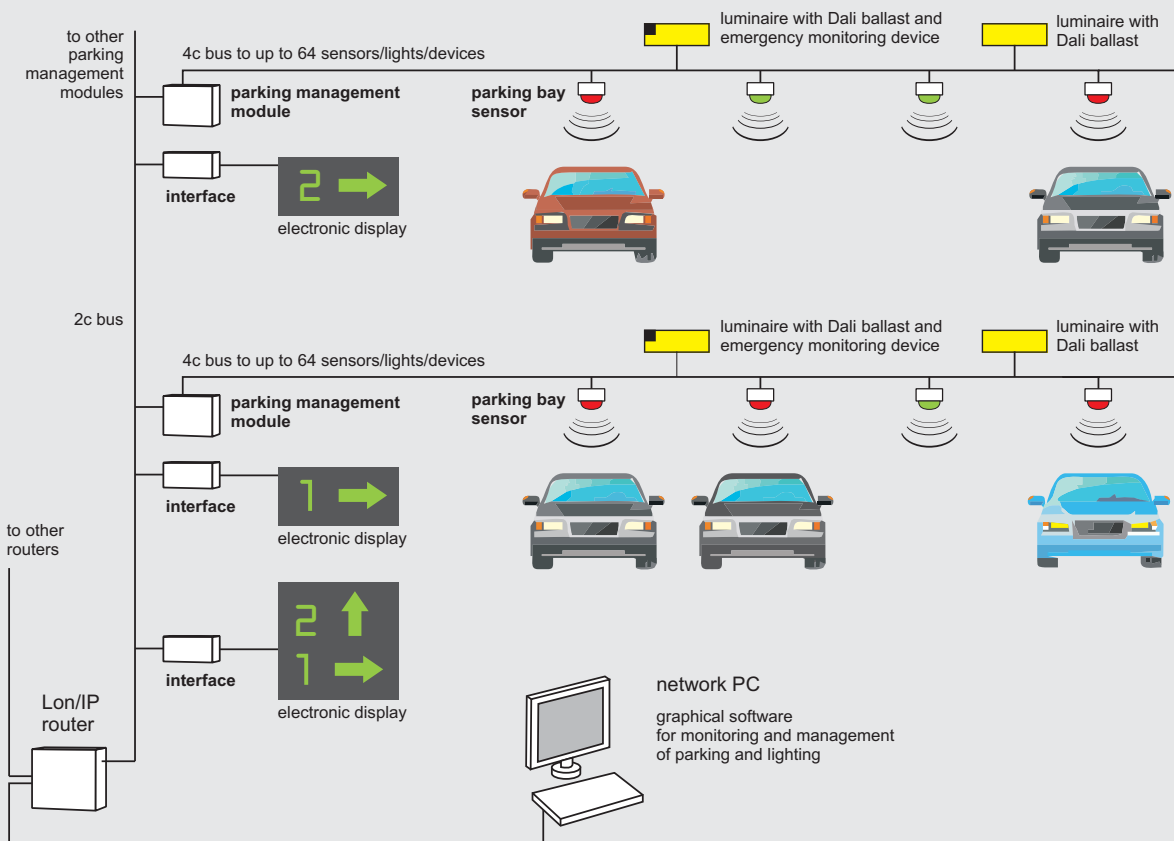
LED indicators visually highlight the status of bays, direct drivers to free bays and feedback comprehensive data to optimise traffic flow and the utilisation of space.

Parking guidance can operate stand-alone or form an integrated part of the carpark lighting installation including interactive control of lighting as well as emergency lighting testing and monitoring: integration with card-entry devices or personalised fobs enables activation of lighting from the entry to an individual parking bay and from that bay to the pedestrian exit points.

visit our web site for an electronic specification

schematic wiring diagram

The parking guidance system comprises parking bay sensors, parking management modules, display boards and interfaces, and graphical software. Parking management and lighting management may be integrated a shared network to enhance operational efficiency and reduce cabling and installation.





parking bay sensor

Parking Bay Sensors enable drivers to look down an aisle of parked cars and instantly identify vacant spaces from the green or red indication above each bay: disabled bays are highlighted by blue indication and other colours are configurable to signify functions such as reserved bays family bays, etc.

The sensors comprise sealed ultrasonic detectors with integral indicator LEDs, and monitor each parking bay to determine whether the space is occupied by a vehicle or vacant for use. The bay status is displayed by eight high-brightness RGB LED indicators which provide 360 degree display so that the bay status can be seen from any angle. remote satellite indicators are also available for remote indication.

The parking bay sensors feedback occupancy status in real time to the Parking Management Modules and availability is displayed on electronic signage and message boards which guide drivers to vacant spaces: occupancy data is also fed back to the head-end PC Parking Management Software for monitoring, logging and analysis.

The Parking bay sensors can integrate with the lighting management system across a shared network buswire.



height - 70 mm
diameter - 110 mm

parking management module

The **parking management module** provides powerful independent control and monitoring of up to 64 parking bay sensors and collates information on occupancy status for onward transmission to the head-end PC.

The module connects to the parking bay sensors via a four-core buswire. Dali luminaires and emergency lighting test devices may also be connected to the module for integrated control of parking guidance and lighting across a shared network.



electronic display board

Electronic display boards and message panels display the real-time availability of parking spaces on a level-by-level or zonal basis to guide drivers speedily and efficiently to vacant parking spaces.



network PC and software

Graphical software monitors the real-time status of each bay, identifies 'over parked' cars for billing or security reasons, enables traffic flows to be analysed, and can generate reports on bay utilization & turnover, demand per sector, time period etc.

The software also enables management of priority parking schemes and reservations. Management and monitoring can be carried out from a head-end PC within the carpark, across networked PCs or via the internet/intranet to a remote monitoring point.



technical advice

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 and advice on the best-practice application of systems.

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

We assist in the development of scheme and concept designs, the preparation of system specifications and the creation of project-specific schematics and layouts: we subsequently liaise with tendering and installing contractors, and hand-over a fully operational system to trained client personnel.

The growing trend towards sustainable buildings design means that lighting, air-conditioning, solar shading & security systems increasingly work together, and Delmatic are able to assist in the project design and application of open-protocol integrated systems.

project management

Effective project management is essential to the success of any installation, and Delmatic coordinate every stage of a project from initial design, delivery and installation through to final commissioning, training and handover.

Delmatic's support services begin at the earliest stages of scheme and concept design while our project management programme starts with the awarding of the project. The process starts with a project handover meeting between the sales and projects teams.

The projects team then plan and coordinate the project through to final completion – deploying resources, scheduling deliveries, developing commissioning programmes, issuing documentation and arranging training, as well as continually monitoring progress.

An on-site pre-installation meeting and regular review meetings ensure the contractor is fully up to speed with the system hardware and installation while Delmatic's pocket-sized Installation Guides provide electricians with handy tips and guidelines for an optimum install.

To guarantee technical competence at the highest level, Delmatic maintain a team of full-time commissioning engineers who carry out system configuration and commissioning. The complete process is overseen by a project manager who, together with the project engineers, ensures systems are configured, commissioned and handed over on time.



Find out more

To discuss the application of lighting management to a project or simply learn more about technologies and systems, contact

delmatic@delmatic.com

UK 020 8987 5900

UAE 04 2566 722

Qatar 4452 8226

Saudi 01 211 8170

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delmatic

Delmatic specialise in the design and supply of advanced integrated lighting management solutions.

Five decades of experience in intelligent controls coupled with our unmatched research and development programme creates integrated hardware and software at the cutting-edge of the electronics, lighting and IT sectors.

Delmatic are committed to openness and our systems use the internationally adopted protocols of Dali, Lon and IP. Our involvement in the application of these technologies to some of the world's largest building services installations makes us experts in such solutions, and we can assist in developing sustainable systems which seamlessly integrate lighting, air-conditioning, solar shading and security.

Our service embraces every stage of a project - starting from the earliest days of concept design and working with the team to understand the project requirements, unmatched technical assistance in developing an optimised lighting and energy-management scheme, comprehensive project management during installation, and culminating in the handing over of a fully-operational system to trained client personnel.

With offices in London, Dubai, Qatar and Saudi Arabia, and partners in key markets throughout the world, Delmatic actively leads the international lighting management industry and continues to excel in the development of innovative and sustainable solutions for an international client base.

London

Delmatic Limited

The Powerhouse
Power Road
London, W4 5PY, UK

t + 44 (0) 20 8987 5900
f + 44 (0) 20 8987 5957
e delmatic@delmatic.com
w www.delmatic.com

Dubai

Delmatic Arabia

DAFZA
Dubai, UAE

t + 971 (0) 4 2566 722
f + 971 (0) 4 2566 723
e sales@delmaticarabia.ae
w www.delmaticarabia.com

Qatar

Delmatic Qatar CRO

Commercialbank Plaza
Doha, Qatar

t +974 4452 8226
f +974 4452 8248
e sales@delmaticqatar.com
w www.delmaticqatar.com

Saudi Arabia

Delmatic Saudi LC

Kingdom Tower
Riyadh, Saudi Arabia

t +966 (0) 1 211 8170
f +966 (0) 1 211 8001
e sales@delmaticsaudi.com
w www.delmaticsaudi.com