



Technical Submittal 57
Commercial Lighting Control

DOCUMENT STATUS

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Executive Summary

The purpose of this technical submittal is to provide the reader with an overview of the Commercial Building Lighting Control System and materials to be provided within the MCFC North Stand Development.

Appendix A - Basis of Design

- Document No: NSE-MEE-NS-XX-TS-E-008001 RIBA Stage 4a Interim
Revision: P01
- Document No: NSE-MEE-NS-XX-TS-E-008002 RIBA Stage 4a
Revision: P01
- Document No: NSE-MEE-NS-XX-LS-E-008001 RIBA Stage 4a Interim
Revision: P02

Appendix B - Manufacturers Details

Company Name: Simmtronic
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Web: www.simmtronic.com

Appendix C - Technical Literature

As per technical data attached - see appendix H.

Appendix D - Compliance

In line with the electrical specification and equipment schedule:

- Document No: NSE-MEE-NS-XX-TS-E-008001 RIBA Stage 4a Interim
Revision: P01
- Document No: NSE-MEE-NS-XX-TS-E-008002 RIBA Stage 4a
Revision: P01
- Document No: NSE-MEE-NS-XX-LS-E-008001 RIBA Stage 4a Interim
Revision: P02

Appendix E - Non -Compliance

N/A

Appendix F - Programme

The Purpose of this technical submission is to inform the Etihad client team and professional team of SES intent regards to procurement of systems and equipment to enable input into the MEP design and therefore complete the systems MEP design.

The Technical submission is by no means intended to show full systems design by the way of MEP design drawings and schematics.

Drawings and Schematics will follow once technical submissions have reached A or B status and the technical information from within the approved submission has been inputted into the MEP design.

Appendix G - Drawing Reference

See back pages of technical submittal.

Appendix H - Attachments

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TECHNICAL SUBMITTAL



MCFC Commercial Building

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Simmtronic Ref Number: P51421

Date: 14/03/2025

Issue: A

Package: Lighting Controls

Installing Contractor: SES Engineering Services

Section One: Project Overview

Section Two: Schedule of Equipment and Data Sheets

Section Three: Typical Project Schematics

Section Four: Commissioning and Control Philosophy

Section Five: Associated Documents consisting of

- SPECS 3 Simmtronic Installation Requirements
- SPECS Cable Specifications
- LCM Numbering System
- Luminaire Plug Wiring Details
- Simmtronic Breeam Document

SECTION ONE

Tenant Areas:

Each Tenants demise has one Area Controller. These Area Controllers are all networked together over the IP network.

Hardwired DALI hub with Relays. (SPH.27-R or SPH.48-R)

Each of the Hubs will provide Power and DALI dimming to 2 separate outputs. Each output has a Switched Relay, Permanent Live Output, and can be connected to up to 20/40 DALI ballasts and 10/20 DALI Inverters. Each DALI ballast can be sub-addressed to so can be uniquely controlled as required. Each Output can also be connected to up to 12 control devices (PDs, Switches).

The relay may be utilised to switch the non-DALI devices on/off in line with the local input devices.

Hardwired DALI hub. (SPH.27 or SPH.48)

Each of the Hubs will provide DALI dimming to 2 separate outputs. Each of the DALI/lighting Outputs can control up to 20/40 DALI ballasts and 10/20 DALI Inverters Each DALI ballast can be sub-addressed to so can be uniquely controlled as required. Each Output can also be connected to up to 12 control devices (PDs, Switches).

Four Channel Hardwired DALI hub. (SPH.227 or SPH.248)

Each of the Hubs will provide DALI dimming to 4 separate outputs. Each of the DALI/lighting Outputs can control up to 20/40 DALI ballasts and 10/20 DALI Inverters Each DALI ballast can be sub-addressed to so can be uniquely controlled as required. Each Output can also be connected to up to 12 control devices (PDs, Switches).

The SPU-6 type sensors we are providing are combined heads; they provide presence detection and can be used to dim lights by the windows via an integral photocell, if there is sufficient daylight. On this project we will initially program the first 2 rows of lights for this function. These sensors plug into the local LCM and can be programmed to control any light on any port of any LCM. The presence and photocell functions although combined into one head are two separate addressable elements.

The SPF4-D Compact Switch Interfaces can be connected to 3rd party retractive switches. These interfaces are uniquely addressed and connect to the local LCM/DALI Hub and can be programmed to control lights on any port of any LCM.

Landlord Core Areas:

The Landlords Core Area will have its own Area Controllers. These Area Controllers are all networked together over the IP network.

The fire alarm will be interfaced with one of these Area Controllers via a volt-free contact. On receipt of a signal from the fire alarm all lighting will default to maximum level until the signal is removed

Hardwired DALI hub with Relays. (SPH.27-R or SPH.48-R)

Each of the Hubs will provide Power and DALI dimming to 2 separate outputs. Each output has a Switched Relay, Permanent Live Output, and can be connected to up to 20/40 DALI ballasts and 10/20 DALI Inverters. Each DALI ballast can be sub-addressed to so can be uniquely controlled as required. Each Output can also be connected to up to 12 control devices (PDs, Switches).

The relay may be utilised to switch the non-DALI devices on/off in line with the local input devices.

The relay of the SPH.**-R hubs be utilised to switch the Toilet Water Solenoid Valve Power on/off in line with the local Presence Detectors

Hardwired DALI hub. (SPH.27 or SPH.48)

Each of the Hubs will provide DALI dimming to 2 separate outputs. Each of the DALI/lighting Outputs can control up to 20/40 DALI ballasts and 10/20 DALI Inverters Each DALI ballast can be sub-addressed to so can be uniquely controlled as required. Each Output can also be connected to up to 12 control devices (PDs, Switches).

Four Channel Hardwired DALI hub. (SPH.227 or SPH.248)

Each of the Hubs will provide DALI dimming to 4 separate outputs. Each of the DALI/lighting Outputs can control up to 20/40 DALI ballasts and 10/20 DALI Inverters Each DALI ballast can be sub-addressed to so can be uniquely controlled as required. Each Output can also be connected to up to 12 control devices (PDs, Switches).

The SPU-6 type sensors we are providing are combined heads; they provide presence detection and can be used to dim lights by the windows via an integral photocell, if there is sufficient daylight. On this project we will initially program the first 2 rows of lights for this function. These sensors plug into the local LCM and can be programmed to control any light on any port of any LCM. The presence and photocell functions although combined into one head are two separate addressable elements.

The SPL.2 External Photocell will be utilised to detect dusk and dawn settings utilising the integral photocell.

The SPK.9 Switch plates are uniquely addressed and connect to the local LCM/DALI Hub and can be programmed to control lights or blinds on any DALI address or port of any LCM.

The SPF4-D Compact Switch Interfaces can be connected to 3rd party retractive switches. These interfaces are uniquely addressed and connect to the local LCM/DALI Hub and can be programmed to control lights on any port of any LCM.

Head-end PC and DALI Emergency Testing System:

The Area Controllers for both Tenant and Landlord areas will be linked back to the PC head end via the T-Bus or IP network.

The PC head end provides a graphical picture of the entire lighting installation connected the lighting control system and the ability to graphically view lamp/ballast/emergency inverter/battery faults. The PC head end will be where the client can make software changes and re-configure the system.

The internal real-time astronomical clock controls timed functions according to longitude/latitude based dusk and dawn settings which are automatically adjusted for daylight savings time and leap years.

The DALI Automated Testing System (ATS) will automatically test, monitor, and report the status of the DALI Emergency Inverters connected to the lighting control system. A functional test is carried out monthly and a full duration test is carried out annually. These tests are carried out over a period of 12 days to ensure that no adjacent luminaires are tested together; therefore, ensuring no areas are put at risk.

The PC head end will also provide the point at which the BMS will be interfaced for the exchanging of high-level information e.g. providing presence information.

Smart Building Interface Provision:

The Simmtronic SPC.3020 will be provided with the SPN.410 Smart Building Integration Suite pre-installed, enabling open protocol high level integration with the client's intelligent building system of choice.

The SPN.410 will include both a BACnet/IP Device and a native MQTT Client for real time data exchange with other building services/the client intelligent building platform.

SECTION TWO

Schedule of Lighting Control Equipment (see attached Data Sheets)

Area Controllers:

SPX.331 Area Controller IP Enabled, T-bus, Bluetooth & Communications Node (RF)

Hardwired Modules:

SPH.27 DALI Hardwired Lighting Control Module with SPECS3 Dual Bus capability

SPH.27-R DALI Circuit Control Module with SPECS3 Dual Bus capability

SPH.48 Hardwired DALI Hub with enhanced driver capacity

SPH.48-R Hardwired DALI Hub with enhanced driver capacity & Relays

SPH.227 Four Channel Hardwired DALI Hub with DALI only

Multisensors:

SPU.6-C1 Compact Universal Sensor with Presence Detector, Photocell & IR, BESA/Conduit Box Mounting

SPU.6-C6 Universal Sensor with Presence Detector, Photocell & IR, Recessed Mounting

Scene Plates and Switches

SPF.4D Compact Switch Interface with SPECS3 Dual Bus capability

Interfaces:

SPF.10 Flexible Interface with Latching Relay Output

External Devices:

SPL.2 External Photocell 2000 Lux Range.

Head-end PC and DALI Emergency Testing System with BMS Interface:

SPC.3020 Advanced Processor for SPECS3 Integration Package & SPM300 Software (includes Astronomical Time-clock)

SPECS Viewers And Easy Configuration Tools

SPN.200 DALI ATS Emergency Monitoring Software

SPN.410 Data exchange Suite/BMS Interface

Daylight Cycle Control Suite

MQTT Licence

SPX.331 AREA CONTROLLER



- High performance networked area controller.
- Flexible configuration via SPECS Manager graphical software.
- Mains integrated or Bus wired lighting control signalling.
- Pre-commission and override test mode.
- Maintains configuration and time keeping without power.
- Built in load shedding and alarm outputs.
- Built in Control Panel with:
 - Manual Keyswitch Lock
 - Override and Normal Mode selection
 - Emergency Test and Check Mode selection
 - System status indicators
 - Configurable "SoftPlate".

This Area Controller is at the heart of the advanced SPECS3 lighting control system. It is sited at a lighting distribution board and will provide autonomous control of all lighting fed from the board.

Sensor and LCM Connection

All sensors and switch plates within the area can either be connected back to the SPX.331, using a simple unscreened twisted pair cable called E-Bus, or plugged into the nearest LCM. E-Bus may be connected in a radial or spurred fashion and provides each E-Bus device with both power and communications. The SPX uses information and commands provided by the E-Bus devices to control the lighting settings within the area.

As standard the SPC will communicate with LCMs using the rugged mains tolerant SPECS M-Bus. M-Bus can be either a separate twisted pair bus or integrated into a modular wiring/track system. With SPECS M-Bus technology E-Bus devices can be plugged directly into the LCM. Compatibility with legacy mainsbourne systems can still be achieved with this Area Controller. An F-Bus interface is now incorporated to allow SPR.40 Bluetooth Nodes to be added to the SPECS3 system, again using a simple unscreened twisted pair cable.

SPX Networking

Within all installation, all SPXs are networked together. The network allows information to flow seamlessly between controllers and provides for system programming and monitoring. Once configured, the SPX runs stand-alone, with each SPX maintaining its data and internal time clock during loss of power.

SPECS3 offers a choice of SPX Network. For standard and smaller systems the single twisted pair C-Bus provides the simplest and most cost effective solution. For larger schemes and where more advanced SPECS3 Integration features may be required, the twin swisted pair T-Bus is recommended. Alternatively SPX.331 IP-enabled Area Controllers connect directly to existing infrastructure providing the ultimate in speed and localised data exchange. Further guidance on the choice of area controller networks is available upon request. Area Controllers are also available with an in-built radio communications node which supports SPECS3 radio switch plates, remote DALI addressing and system programming.

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Overrides and Test Modes

The SPX.331 can also be wired directly to volt free "load shedding", and "alarm" signal contacts, any contact can be used to affect all SPXs on the area controller network. Two levels of load shedding are provided, both are software configurable, the alarm input generally forces all lighting to maximum. The SPX control panel provides selection and indication of two independently configured emergency test groups; as required the panel may be locked from the manual key switch. Once the system has been installed, the SPX area controllers should be powered up. As supplied the system will usually be in "Pre-Commissioned Mode", the mode allows the system to be tested to see that all equipment is installed and working properly, see the datasheet 'Overriding the Control System' for more details.

Installation

The SPX Area Controller should only be installed in "no operation access" areas where access is only achieved by use of a tool and adjacent to the distribution board that supplies its area of lighting. If utilising the mainsbourne signalling system, the SPX should be connected a minimum of 10 metres from the Earth Neutral Bond point. The SPX must be installed in accordance with the current IEE wiring Regulations and a readily accessible disconnection device (i.e circuit breaker or fused spur) shall be incorporated in the building installation wiring. The rating of which should not exceed 6Amps.

The SPX should be mounted at or below shoulder height to allow access to the control panel. Also ensure there is not any conduit, trunking or cable within 100mm of the stub antenna. Keyhole brackets are provided along with fixing holes beneath the lower wiring cover to ensure adequate fixing. There is no need to remove the upper cover to which the control panel is fitted.

M-Bus cables* connect here. Four separate M-Bus runs are supported and should be wired as indicated on the installation drawings. The wiring polarity should be: Black -ve, Red +ve.

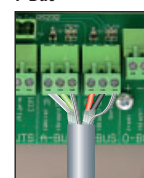
E-Bus cables* which connect to sensors and switch plates etc, will normally be connected to E-Bus 1 unless otherwise advised. For ease of wiring two connectors are provided on each E-Bus, the wiring polarity should be: Black -ve, Red +ve.

F-Bus cable* connector- the wiring polarity should be: Black -ve, Red +ve.

Volt Free Inputs are connected here for Load Shedding and Alarm function.

All SPXs should be networked together using either C-Bus, T-Bus or IP. Note that T-Bus is a Twin twisted pair, one pair connecting C-Bus and the other connecting A-Bus. Screen drain wires should be kept short, insulated and wired to the screen (SCRN) terminal only. Never run network cables with mains wiring.

T-Bus



C-Bus Only



Optional O-Bus output.

Lighting control modules within an area have a 4 digit address e.g. 0124; the first two digits (01 in this case) should be the same as the SPX number shown in this box.

When connected the SPX should be powered up prior to commissioning visits, this will give a good indication that the system is operating correctly. Simple wiring faults such as shorts on E-Bus, F-Bus, M-Bus, C-Bus or T-Bus will not damage the SPX.

*If any of these bus cables are run with mains wiring then ensure the cable has the correct insulation rating. Simmtronic approved bus cables are suitable for incorporating with single phase wiring only. See Simmtronic Cable Data Sheets for more details and suitable cable types.]

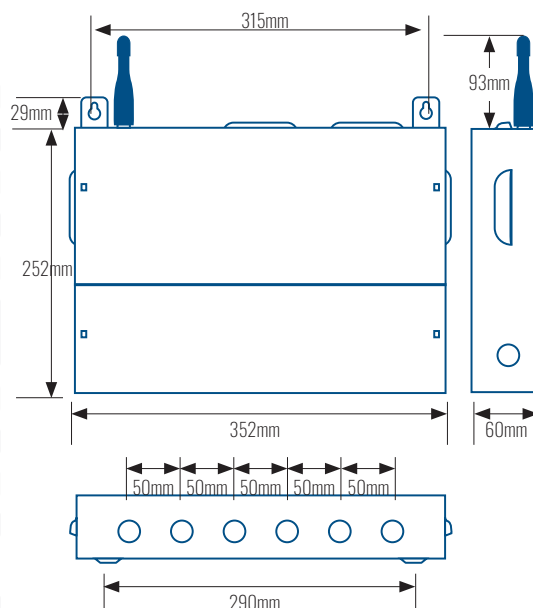
General Specification

Supply:	230VAC, 50Hz
Fuse:	Internally fixed, non replaceable - 3A fused supply
Weight:	2.75kg
Tamb:	0 to 30°C
Data retention:	10 Years (un-powered)
E-Bus:	FELV, 2 short circuit proof bus drives. Power Limit: 64 devices per E-Bus. Max Cable Length: 200m Max
O-Bus:	128 control modules
C-Bus/T-Bus:	FELV, RS485, short circuit proof, 120 Max SPX.S. Max Cable Length: 1000m
M-Bus:	FELV, 4 short circuit proof bus drives, 32 LCMs per bus. Max Cable Length: 200m
F-Bus:	FELV, 1 short circuit proof bus drive, 30 nodes. Max Cable Length: 200m

Part No.

Description

SPX.331	Area Controller with Bus wire communications
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SPH.27 DALI HARDWIRED HUB



- Full addressability.
- Ideal for riser mounting.
- Capacity to drive 60 DALI devices.
- Built-in E-Bus drivers with capacity to drive 24 devices.
- Supports DALI Bus connected SPECS3 Multi-sensors.
- Status LEDs.

The SPH.27 enhances the SPECS3 lighting control system to provide DALI control to hardwired installations such as stairwells, toilets, lobbies and corridors. This unit is only suitable for control of luminaires fitted with DALI ballasts and DALI inverters, as all control is achieved digitally. It does not switch the power circuits, this means that lighting circuits are wired directly from the dist. board circuit breaker to the luminaires.

This SPH.27 provides two DALI drivers; this reduces DALI delays and reduces the chance of losing all control should a bus fault occur. Each driver is capable of controlling half the total loading of 40 ballasts or transformers and 20 emergency inverters (see note). E-Bus drivers are also provided that can accommodate 2x12 devices like presence detectors and switches. Up to 2x12 SPECS3 Dual-Bus sensors can instead be connected to the DALI bus to facilitate luminaire wiring. The unit is controlled using a message format that includes error detection, using single unscreened twisted pair cable called SPECS M-Bus.

Output Wiring

The Hub should be supplied with 230VAC from a fused spur fitted with a 1Amp fuse. The mains supply connection terminal block, along with the M-Bus terminal block, are positioned at the top of the circuit board and are accessible by removing the top half of the lid. Removing the bottom half of the lid provides access to the DALI and E-Bus terminals. All terminal blocks are pluggable to facilitate easy wiring. Note that as stated above, the lighting circuits are not wired through this unit as it does not switch the load.

CONTACT US

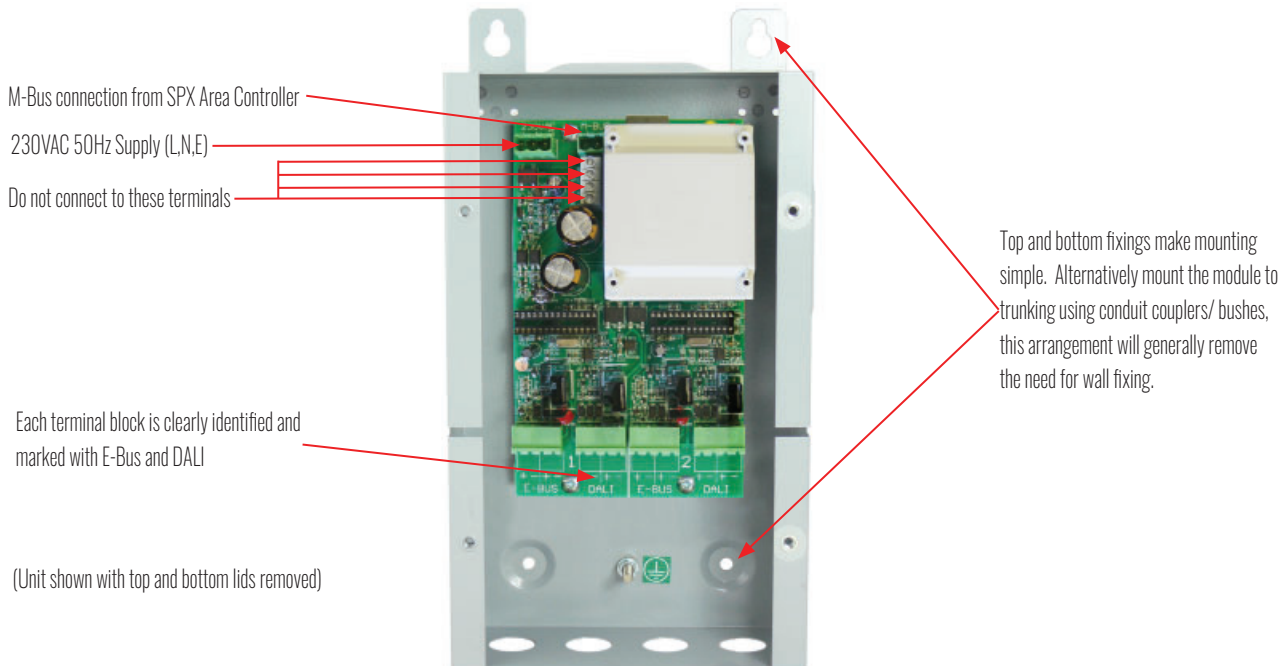
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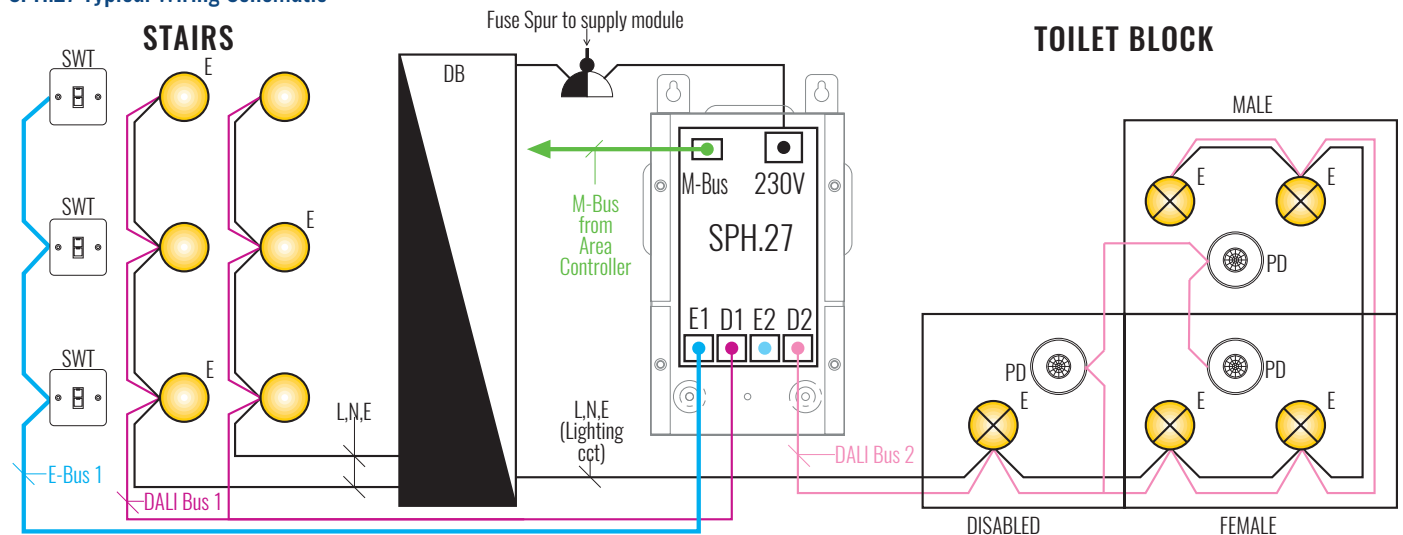
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Location and Installation

The unit's enclosure is a construction of rugged grey powder coated steel. 4 fixing points are provided along with multiple 20mm conduit entries, making it suitable for installation within an electrical riser cupboard. Care should be taken not to block the side and top air vents when mounting in close proximity with other equipment. The top lid carries a label with a unique 4-digit address and circuit reference (if known). This information should be used to ensure that each unit is fitted and wired at the correct location as detailed on the lighting drawings.



SPH.27 Typical Wiring Schematic



This is a typical schematic showing a SPH.27 controlling all the lighting and emergency DALI Inverters.

NOTES: SPH.27 can not be used with non-DALI Emergency Inverters, as only a 3 wire lighting circuit is used.

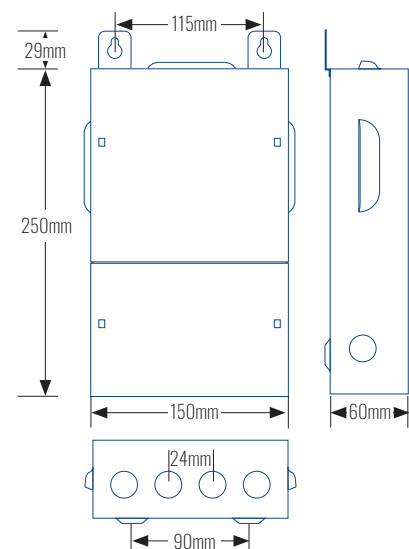
DALI Emergency Inverters can only be tested via the Simmtronic ATS software.

Area controller Test buttons can not be used.

General Specification

Supply:	230VAC, 50Hz
Rating:	1 Amp (controller only)
Weight:	1.5kg
Tamb:	0 to 35°C
DALI Outputs:	2 x 20 ballasts, 2 x 10 emergency inverters 2 x 12 multi-sensors (not both)
E-Bus Capacity:	2 x 12 Devices (not both)

Part No.	Description
SPH.27	DALI Hardwired Lighting Control Module with SPECS3 Dual-Bus sensor capability



SIMMTRONIC

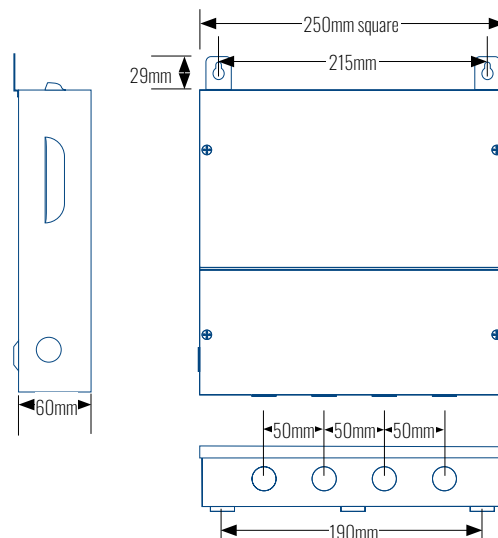
SPH.27-R DALI HARDWIRED HUB WITH RELAYS



- Full addressability
- Ideal for riser mounting
- Built-in E-Bus drivers with capacity to drive 24 devices
- Supports DALI Bus connected SPECS3 Multi-sensors
- Status LEDs
- Modular wiring friendly
- Mains circuit termination
- Two circuit module
- Lighting circuit marshalling provided
- Capacity to drive 60 DALI devices
- Optional relay switching

The SPH.27-R enhances the SPECS3 lighting control system to provide DALI control to hardwired installations such as stairwells, toilets, lobbies and corridors. This unit is suitable where luminaires with DALI ballasts and DALI inverters are used. It is designed to take up to two lighting circuits and provides a Live Out, Switched Live and a Maintained Live for each. This gives the option to mix DALI and non-DALI equipment. This Hub provides two DALI drivers (one per circuit); this reduces DALI delays and reduces the chance of losing all control should a bus fault occur.

Each driver is capable of controlling half the total loading of 40 ballasts or transformers and 20 emergency inverters (see note). E-Bus drivers are also provided that can accommodate 2 x 12 devices like presence detectors and switches. Up to 2 x 12 SPECS3 Dual-Bus sensors can instead be connected to the DALI bus to facilitate luminaire wiring. The unit is controlled using a message format that includes error detection, using a single unscreened twisted pair cable called SPECS M-Bus.



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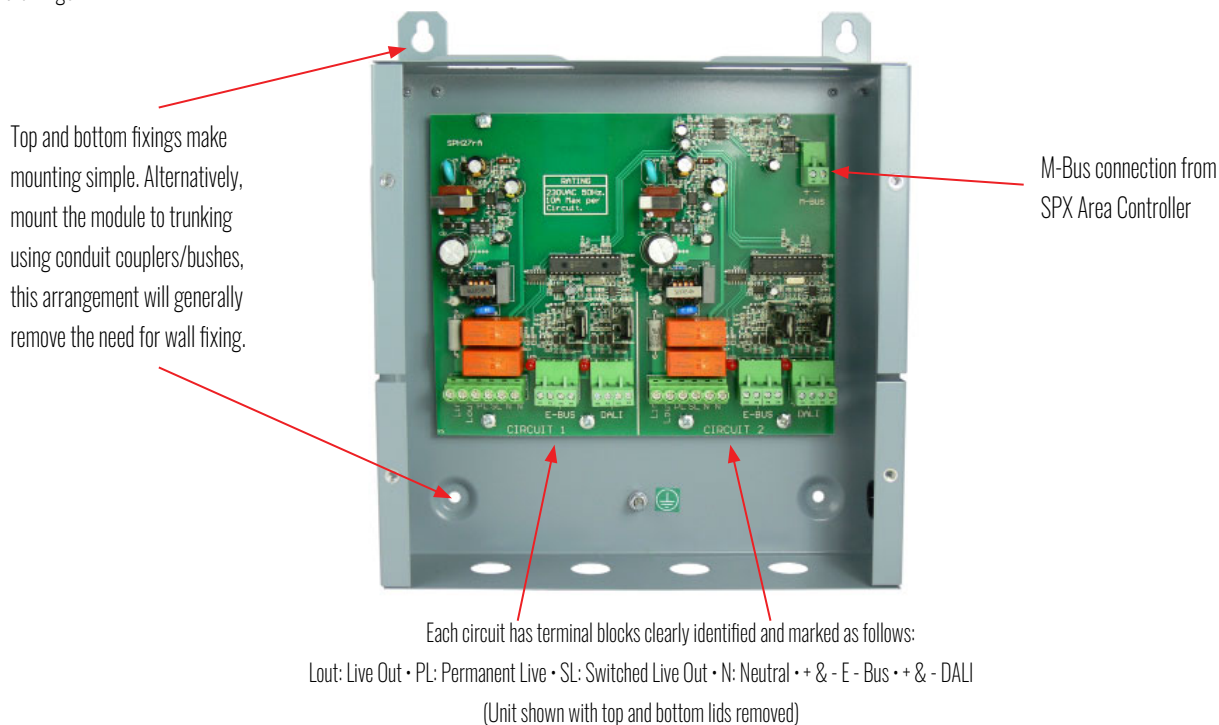
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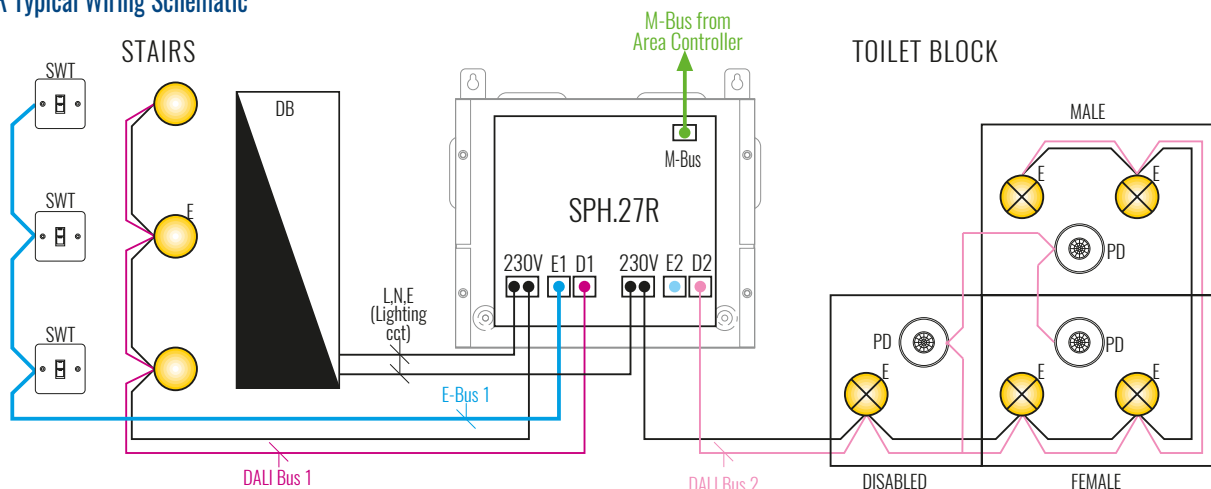
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Location and Installation

The unit's enclosure is a construction of rugged grey powder coated steel. Four fixing points are provided along with multiple 20mm conduit entries, making it suitable for installation within an electrical riser cupboard. Care should be taken not to block the side and top air vents when mounting in close proximity to other equipment. The top lid carries a label with the unit's own unique 4-digit address and circuit reference (if known). This information should be used to ensure that each unit is fitted and wired at the correct location as detailed on the lighting drawings.



SPH.27-R Typical Wiring Schematic



This is a typical schematic showing a SPH.27-R controlling all the lighting and emergency DALI Inverters.

NOTES: SPH.27-R can be used with non-DALI Inverters, if they are supplied from the 'Permanent Live' terminal.

Area controller Test buttons can only be used if the inverters are supplied from the 'Permanent Live' terminal.

DALI Emergency Inverters are intended to be tested via the Simmtronic ATS Software.

General Specification

Supply:	230VAC, 50Hz
Rating:	10 Amps per circuit
Weight:	1.5kg
Tamb:	0 to 30°C
DALI Outputs:	2 x 20 ballasts, 2 x 10 emergency inverters, 2 x 12 multi-sensors (not both)
E-Bus Capacity:	2 x 12 Devices (not both)

Part No.	Description
SPH.27-R	DALI Circuit Control Module with SPECS3 Dual-Bus sensor capability

SPH.48 DALI HARDWIRED HUB



- Full addressability.
- Ideal for riser mounting.
- Built-in E-Bus drivers with capacity to drive 24 devices.
- Supports DALI Bus connected SPECS3 Multi-sensors.
- Status LEDs.

This unit enhances the SPECS3 lighting control system to provide DALI control to hardwired installations such as stairwells, toilets, lobbies and corridors. The SPH.48 is only suitable for control of luminaires fitted with DALI ballasts and DALI inverters, as all control is achieved digitally. The module does not switch the power circuits, which means that lighting circuits are wired directly from the distribution board circuit breaker to the luminaires.

This unit provides two DALI drivers which reduces DALI delays and the chance of losing all control should a bus fault occur. Each driver is capable of controlling half of the total loading of 80 ballasts or transformers and 40 emergency inverters (see note). E-Bus drivers are also provided to accommodate 2x12 devices such as presence detectors and switches. Up to 2x12 SPECS3 Dual-Bus sensors can instead be connected to the DALI bus to facilitate luminaire wiring. The unit is controlled using a message format which includes error detection, using a single unscreened twisted pair cable called SPECS M-Bus.

Output Wiring

The unit should be supplied with 230VAC from a fused spur fitted with a 1Amp fuse. The mains supply connection terminal block, along with the M-Bus terminal block, are positioned at the top of the circuit board and are accessible by removing the top half of the lid. Removing the bottom half of the lid provides access to the DALI and E-Bus terminals. All terminal blocks are pluggable to facilitate easy wiring. Note that as stated above, the lighting circuits are not wired through this unit as it does not switch the load.

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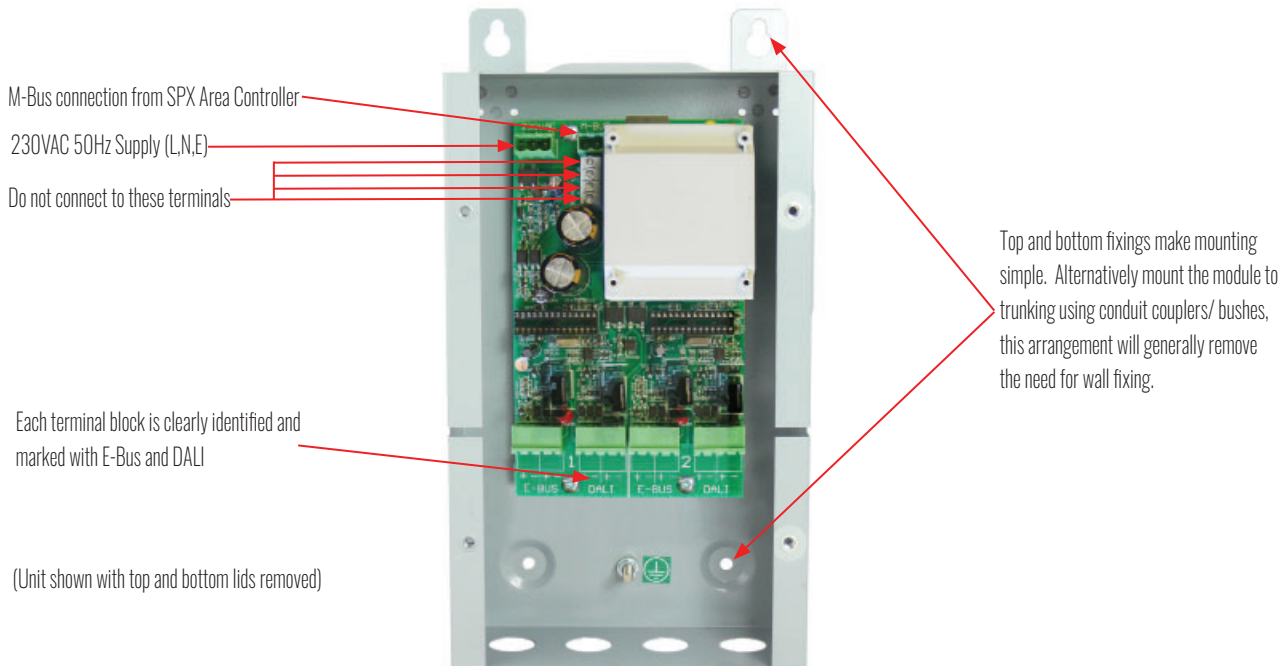
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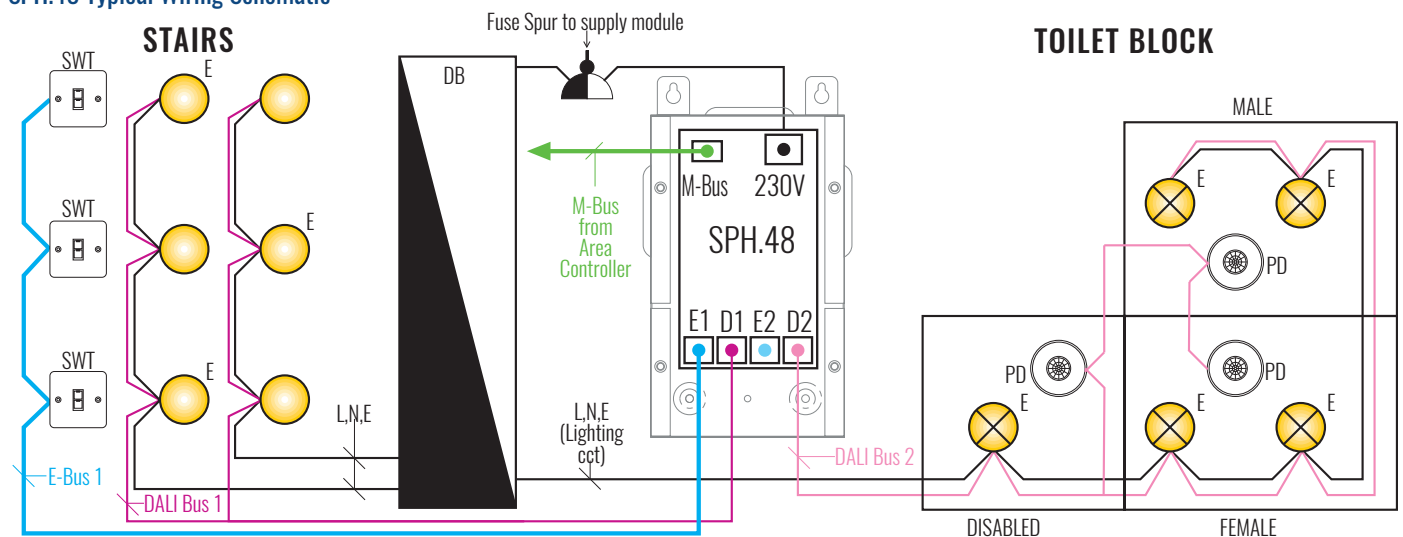
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Location and Installation

The unit's enclosure is a construction of rugged grey powder coated steel. 4 fixing points are provided along with multiple 20mm conduit entries, making it suitable for installation within an electrical riser cupboard. Care should be taken not to block the side and top air vents when mounting in close proximity with other equipment. The top lid carries a label with a unique 4-digit address and circuit reference (if known). This information should be used to ensure that each unit is fitted and wired at the correct location as detailed on the lighting drawings.



SPH.48 Typical Wiring Schematic



This is a typical schematic showing a SPH.48 controlling all the lighting and emergency DALI Inverters.

NOTES: SPH.48 can not be used with non-DALI Emergency Inverters, as only a 3 wire lighting circuit is used.

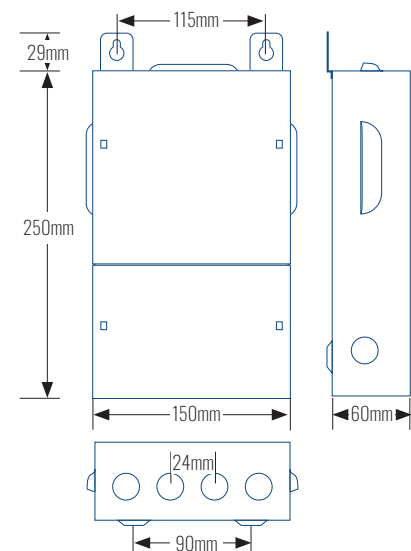
DALI Emergency Inverters can only be tested via the Simmtronic ATS software.

Area controller Test buttons can not be used.

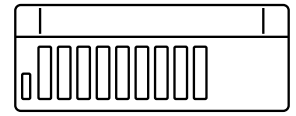
General Specification

Supply:	230VAC, 50Hz
Rating:	1 Amp (controller only)
Weight:	1.5kg
Tamb:	0 to 35°C
DALI Outputs:	2 x 40 ballasts, 2 x 20 emergency inverters 2 x 12 multi-sensors (not both)
Nominal output voltage:	16V mAmp maximum, single master
E-Bus Capacity:	2 x 12 Devices (not both)

Part No.	Description
SPH.48	DALI Hardwired Lighting Control Module with SPECS3 Dual-Bus sensor capability



SIMMTRONIC



LIGHTING CONTROL
MODULES

SPH.48-R DALI HARDWIRED HUB WITH RELAYS



- Full addressability.
- Ideal for riser mounting.
- Built-in E-Bus drivers with capacity to drive 24 devices.
- Supports DALI Bus connected SPECS3 Dual-Bus sensors.
- Status LEDs.
- Modular wiring friendly.
- Mains circuit termination.
- Two circuit module.
- Lighting circuit marshalling provided.
- Optional relay switching.

This unit enhances the SPECS3 lighting control system to provide DALI control to hardwired installations such as stairwells, toilets, lobbies and corridors. This unit is suitable where luminaires with DALI ballasts and DALI inverters are used. The unit is designed to take up to two lighting circuits and provides a Live Out, Switched Live and a Maintained Live for each. This gives the option to mix DALI and non-DALI equipment.

This unit provides two DALI drivers (one per circuit); this reduces DALI delays and reduces the chance of losing all control should a bus fault occur. Each driver is capable of controlling half the total loading of 80 ballasts or transformers and 40 emergency inverters (see note). E-Bus drivers are also provided that can accommodate 2 x 12 devices like presence detectors and switches. Up to 2 x 12 SPECS3 Dual-Bus sensors can instead be

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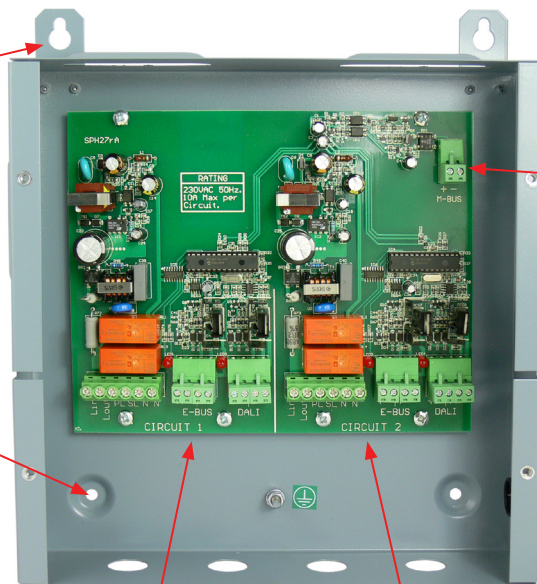
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Location and Installation

The unit's enclosure is a construction of rugged grey powder coated steel. 4 fixing points are provided along with multiple 20mm conduit entries, making it suitable for installation within an electrical riser cupboard. Care should be taken not to block the side and top air vents when mounting in close proximity with other equipment. The top lid carries a label with a unique 4-digit address and circuit reference (if known). This information should be used to ensure that each unit is fitted and wired at the correct location as detailed on the lighting drawings.

Top and bottom fixings make mounting simple. Alternatively, mount the module to trunking using conduit couplers/bushes, this arrangement will generally remove the need for wall fixing.



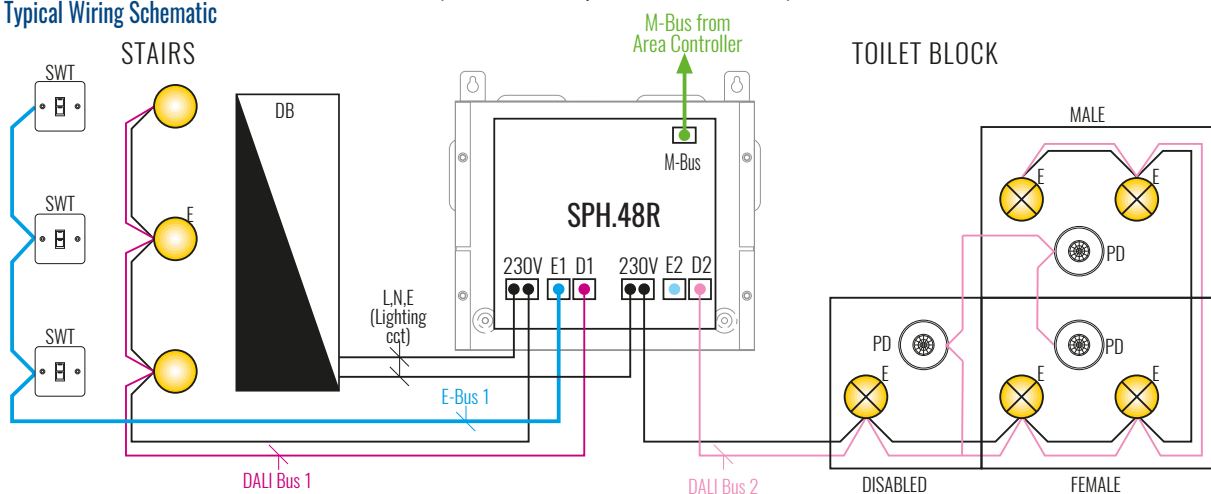
M-Bus connection from SPX Area Controller

Each circuit has terminal blocks clearly identified and marked as follows:

Lout: Live Out • PL: Permanent Live • SL: Switched Live Out • N: Neutral • + & - E - Bus • + & - DALI

(Unit shown with top and bottom lids removed)

SPH.48-R Typical Wiring Schematic



This is a typical schematic showing a SPH.48-R controlling all the lighting and emergency DALI Inverters

NOTES: SPH.48-R can be used with non-DALI Inverters if they are supplied from the 'Permanent Live' terminal.

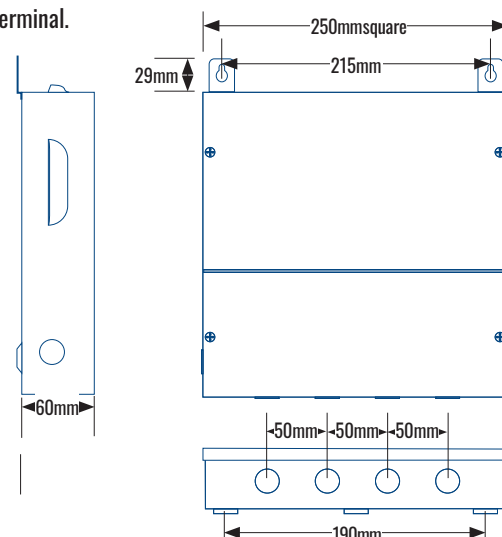
Area controller Test buttons can only be used if the inverters are supplied from the 'Permanent Live' terminal.

General Specification

Supply:	230VAC, 50Hz
Rating:	10 Amps per circuit
Weight:	1.5kg
Tamb:	0 to 30°C
DALI Outputs:	2 x 40 ballasts, 2 x 20 emergency inverters 2 x 12 multi-sensors (not both)
E-Bus Capacity:	2 x 12 Devices (not both)

Part No.	Description
SPH.48-R	DALI Circuit Control Module with SPECS3 Dual-Bus sensor capability

ISSUE H



SPH.227 DALI HARDWIRED HUB



- Full addressability.
- Ideal for riser mounting.
- Capacity to drive 120 DALI devices.
- Built-in E-Bus drivers with capacity to drive 48 devices.
- Supports DALI Bus connected SPECS3 Multi-sensors.
- Status LEDs.

This unit enhances the SPECS3 lighting control system to provide DALI control to hardwired installations such as stairwells, toilets, lobbies and corridors. The SPH.227 is only suitable for control of luminaires fitted with DALI ballasts and DALI inverters, as all control is achieved digitally. This hardwired hub does not switch the power circuits, which means that lighting circuits are wired directly from the distribution board circuit breaker to the luminaires.

This unit provides four DALI drivers which reduces DALI delays and the chance of losing all control should a bus fault occur. Each driver is capable of controlling a quarter of the total loading of 80 ballasts or transformers and 40 emergency inverters (see note). E-Bus drivers are also provided to accommodate 4x12 devices such as presence detectors and switches. Up to 4x12 SPECS3 Dual-Bus sensors can instead be connected to the DALI bus to facilitate luminaire wiring. The unit is controlled using a message format which includes error detection, using a single unscreened twisted pair cable called SPECS M-Bus.

Output Wiring

The unit should be supplied with 230VAC from a fused spur fitted with a 1Amp fuse. The mains supply connection terminal block, along with the M-Bus terminal block, are positioned at the top of the circuit board and are accessible by removing the top half of the lid. Removing the bottom half of the lid provides access to the DALI and E-Bus terminals. All terminal blocks are pluggable to facilitate easy wiring. Note that as stated above, the lighting circuits are not wired through this unit as it does not switch the load.

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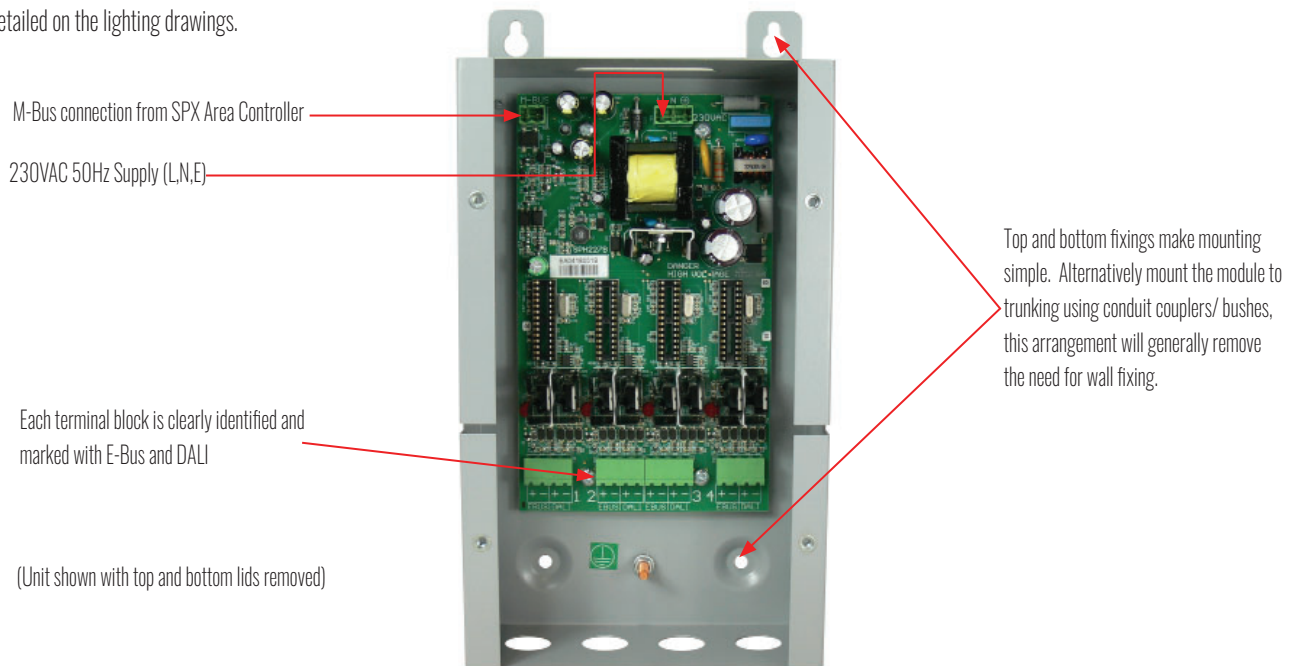
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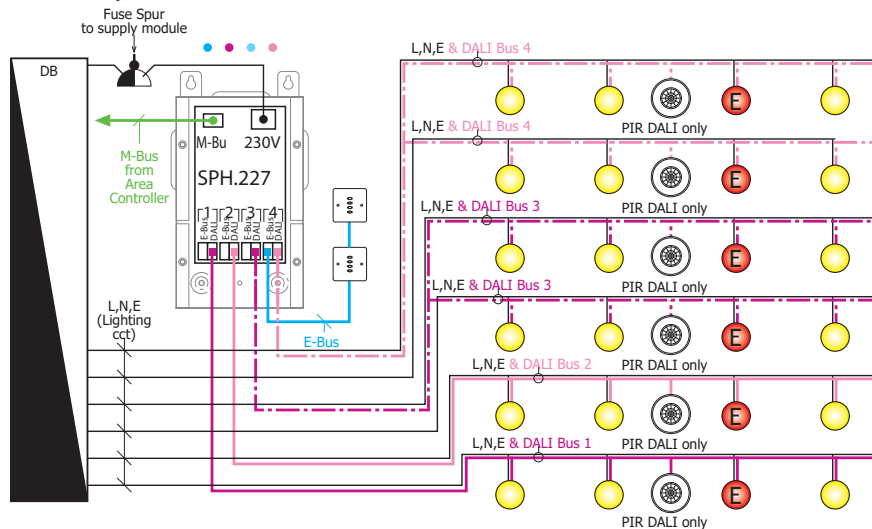
Location and Installation

The unit's enclosure is a construction of rugged grey powder coated steel. 4 fixing points are provided along with multiple 20mm conduit entries, making it suitable for installation within an electrical riser cupboard. Care should be taken not to block the side and top air vents when mounting in close proximity with other equipment.

The top lid carries a label with a unique 4-digit address and circuit reference (if known). This information should be used to ensure that each unit is fitted and wired at the correct location as detailed on the lighting drawings.



SPH.227 Typical Wiring Schematic- Exposed Services Installation



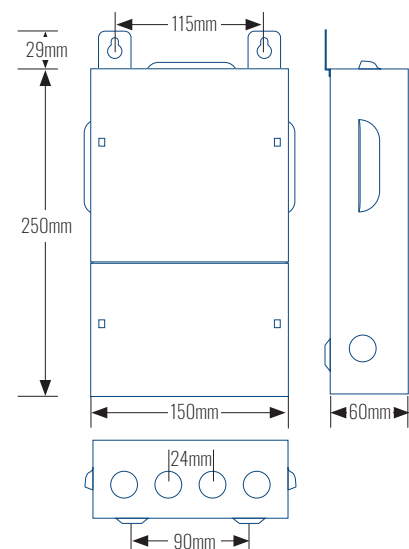
This is a typical schematic showing a SPH.227 controlling all the lighting and emergency DALI Inverters.

NOTES: SPH.227 can not be used with non-DALI Emergency Inverters, as only a 3 wire lighting circuit is used. DALI Emergency Inverters can only be tested via the Simmtronic ATS software. Area controller Test buttons can not be used.

General Specification

Supply:	230VAC, 50Hz
Rating:	1 Amp (controller only)
Weight:	1.5kg
Tamb:	0 to 35°C
DALI Outputs:	4 x 20 ballasts, 4 x 10 emergency inverters, 4 x 12 multi-sensors (not both)
E-Bus Capacity:	4 x 12 Devices (not both)

Part No.	Description
SPH.227	DALI Hardwired Lighting Control Module with SPECS3 Dual-Bus sensor capability.



SPU.6-C1 SURFACE MOUNT COMPACT DUAL BUS SENSOR



- Addressable intelligent Universal Sensor
- Besa or conduit box mountable
- 360 degree PIR presence detection
- Wide range linear photocell
- Programmable infra-red receiver
- Flexible configuration via SPECS Manager graphical software
- Simple E-Bus or DALI connection
- Self test LED indicator
- Compact circular design

The SPU.6-C1 is a sophisticated intelligent universal sensor which combines high performance presence detection, light level sensing and infra-red control into one compact unit.

The sensor can either plug into an LCM's DALI line or the LCM's E-Bus from which both power and communication are achieved. (DALI line connection is only compatible with 9 port LCMs.) The sensor automatically identifies itself on either bus and continuously reports its status and current readings.

SPECS Manager software can uniquely address each sensor and configure each control element to different lighting groups as required. Photocell readings and presence detection history may be dynamically displayed for all sensors connected to the system.

Presence Detection

360 degree presence detection is achieved using a high quality quad element sensor and fresnel lens combination. The presence detector element may be configured to control any lighting group within the SPECS system; a separate group may also be used to hold background lighting on to a lower dimming level. By working with other detectors in overlapping groups, an excellent control regime may be achieved. An additional feature of the device is that different presence detection modes and sensitivities can be remotely programmed.

Photocell Control

A silicon photodiode provides accurate and linear light level measurement over a wide 2000 lux range with 2 lux resolution. The light level reading may be configured to control any combination of lighting groups within the SPECS system, for example to achieve progressive dimming of window rows from a single photocell.

Infra-Red Receiver

The Infra-red receiver within the device will receive commands from the SPECS IR remote (SPI.6 only). The Infra-red commands may be configured either to control individual or multiple lighting groups with dimming or on/off control. The IR system is directional and unaddressed so that a common transmitter may be used to control multiple sensors.

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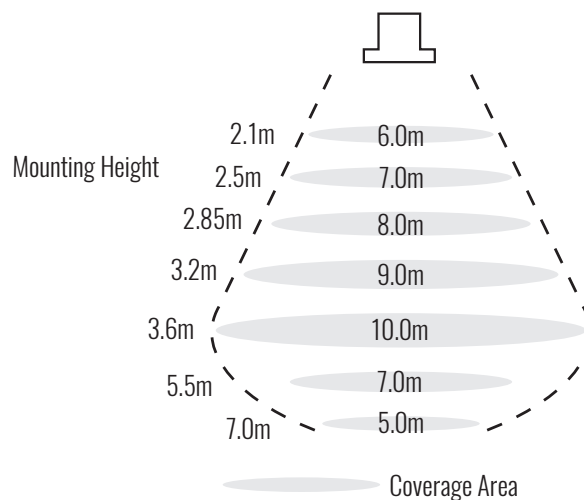
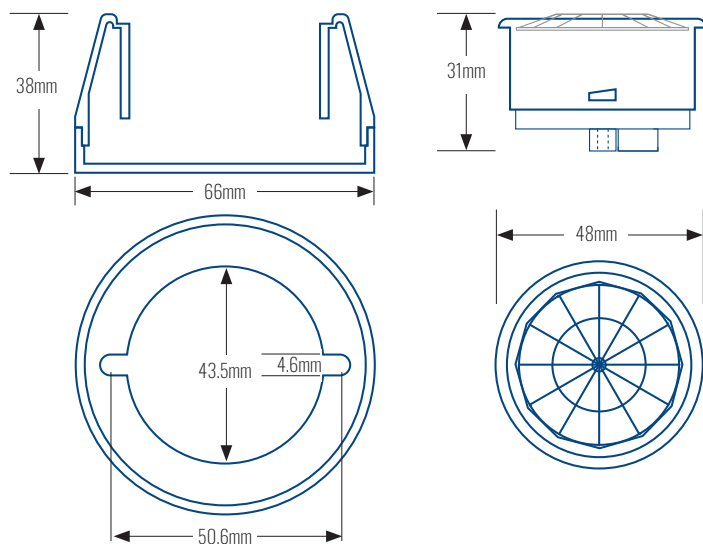
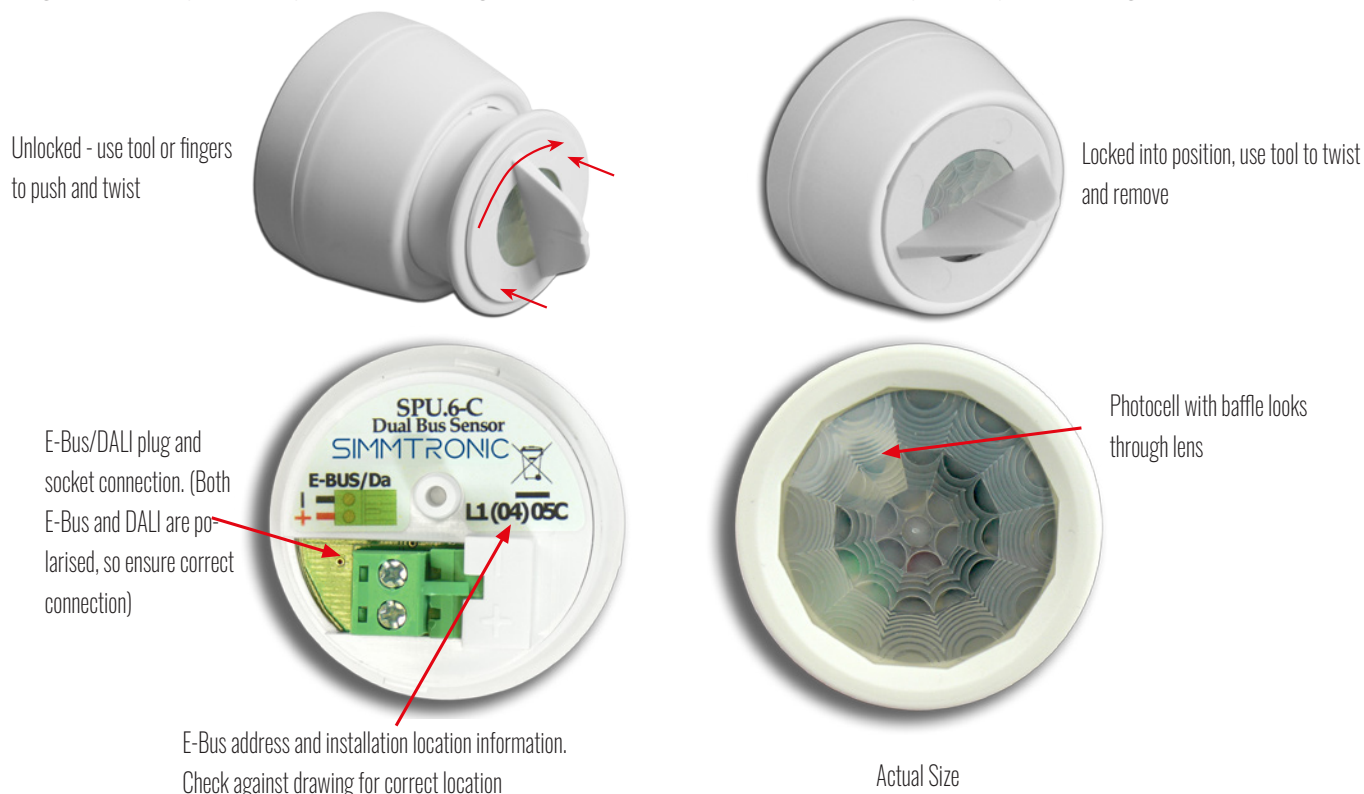
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Installation

Mount base on to circular conduit box, Besa box, or a flat surface using suitable pan head screws through the two screw slots; screw threads on conduit boxes are typically 4mm. Feed the E-Bus/DALI cable with plug through the cone section and clip the cone section to the base, ensuring that the cone is fully clipped to the base through 360 degrees. Plug the bus cable into the sensor and using the twist lock tool or fingers, push and twist lock the sensor in the cone housing. Removal of the sensor is the reverse, due to bus cable tension a slight pulling action may be required to extract the sensor from the cone. The cone and base are separated by either pressing the cone inwards at 90 degrees to the two splits in the clip feature or by inserting a small flat blade screwdriver in either of the two clip feature splits and twisting the blade.



General Specification

Supply:	Two wire combined signal and supply connection via SPECS E-Bus or DALI
Weight:	50g
Tamb:	0 to 40°C
View Field:	d = 2.8 x h

Fixing Holes

The hole slots in the base are suitable for mounting on circular conduit (Besa) boxes using a 4mm screw having fixing centres between 50mm and 50.8.

Standard colour is white (RAL 9003). Available in Black (-B RAL 9005).

Part No. Description

SPU.6-C1	DALI-Bus Universal Sensor Round Service Mount
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SPU.6-C6 RECESSED MOUNT DUAL BUS SENSOR



- Addressable intelligent Universal Sensor
- Suitable for suspended ceiling or plasterboard
- 360 degree PIR presence detection
- Wide range linear photocell
- Programmable infra-red receiver
- Flexible configuration via graphical software
- Simple E-Bus or DALI connection
- Self test LED indicator
- Compact circular design

The SPU.6-C6 is a sophisticated intelligent universal sensor which combines high performance presence detection, light level sensing and infrared control into one compact unit.

The sensor can either plug into an LCM's DALI line or the LCM's E-Bus from which both power and communication are achieved. (DALI line connection is not compatible with 9 port SPV.92 LCMs.) The sensor automatically identifies itself on either bus and continuously reports its status and current readings.

SPECS Manager software can uniquely address each sensor and configure each control element to different lighting groups as required. Photocell readings and presence detection history may be dynamically displayed for all sensors connected to the system.

Presence Detection

360 degree presence detection is achieved using a high quality quad element sensor and fresnel lens combination. The presence detector element may be configured to control any lighting group within the SPECS system; a separate group may also be used to hold background lighting on to a lower dimming level. By working with other detectors in overlapping groups, an excellent control regime may be achieved. An additional feature of the device is that different presence detection modes and sensitivities can be remotely programmed.

Photocell Control

A silicon photodiode to provide accurate and linear light level measurement over a wide 2000 lux range with 2 lux resolution. The light level reading may be configured to control any combination of lighting groups within the SPECS system, for example to achieve progressive dimming of window rows from a single photocell.

Infra-Red Receiver

The Infra-red receiver within the device will receive commands from the SPECS IR remote (SPI.6 only). The Infra-red commands may be configured either to control individual or multiple lighting groups with dimming or on/off control. The IR system is directional and unaddressed so that a common transmitter may be used to control multiple sensors.

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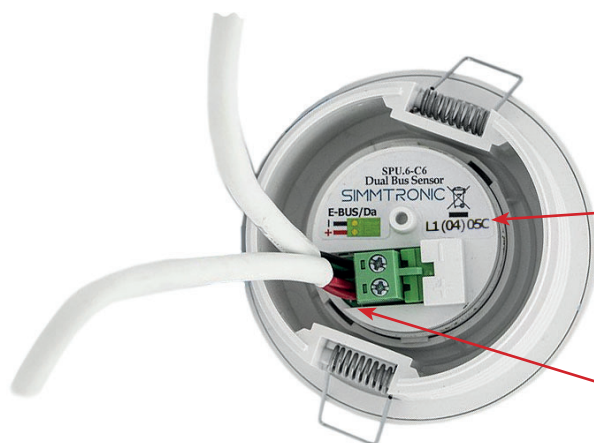
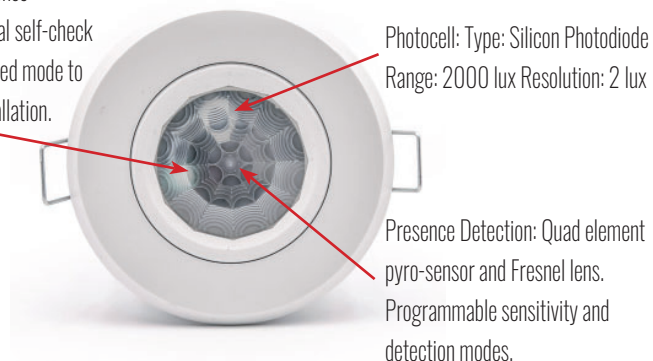
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Installation

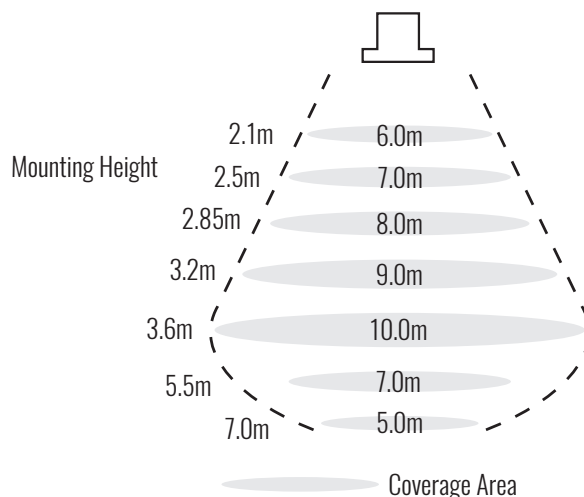
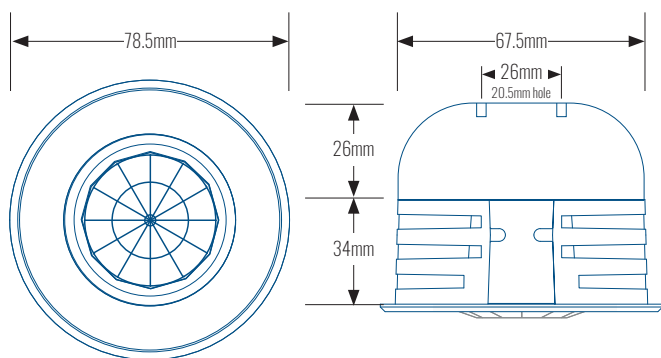
The sensor is fitted to a circular ceiling hole using retractive spring fixings. This arrangement allows the unit to be fixed when there is no access above the ceiling. The back dome provides basic cable strain relief. If the installation require greater strain relief then a 25mm gland can be used.



Includes LED response indicator with visual self-check to pre-commissioned mode to verify correct installation.



E-Bus / DALI plug and socket In and Out connections. (Both E-Bus and DALI are polarised, so ensure correct connection).



General Specification

Supply:	Two wire combined signal and supply connection via SPECS E-Bus or DALI
Weight:	60g
Tamb:	0 to 40°C
View Field:	d = 2.8 x h

Part No. Description

SPU.6-C6	Recessed Mount Dual Bus Sensor
----------	--------------------------------

Circular Ceiling Fixing Hole

The hole must be large enough to accept the 67.5mm diameter main body, whilst being well within 75.5mm outer flange, so that the sensor may be easily positioned to cover the hole when in place. The springs fold back within the body diameter. Given the above, a factory cut hole of 70.0mm diameter is recommended - this will work with solid or sandwich tiles in the range 5-20mm.

Standard colour is white (RAL 9003). Available in Black (-B RAL 9005).

SPF.4D DUAL-BUS SWITCH INTERFACE



- Makes standard switches intelligent and addressable.
- Compact design that can be accommodated within a 45mm deep blackbox.
- Interfaces to four retractive or conventional two position switches.
- Scene or Zonal control modes.
- Individually programmable switches and fade rates.
- Simple twisted pair cable connection to DALI or E-Bus.
- Flexible configuration via SPECS Manager graphical software.

The SPF.4D allows retractive or conventional two position switches to be connected to the SPECS lighting control system in an intelligent fashion.

The SPF.4D can connect to either an LCM's DALI line or the LCM's E-Bus from which both power and communication are achieved. (DALI line connection is only compatible with SPH.27, SPH.27-R, SPV.56, SPV.57 type LCMs.) Flying leads are provided for direct wiring to the switches.

Each switch fitted to the SPF.4D may be individually configured to select or syscle between lighting scenes with adjustable fade rates; different buttons can also be used to control different zones, again with scene selection.

This interface is available in 1,2,3 and 4 switch versions; several SPF.4Ds can be combined when more than 4 buttons are required at a given position. This allows even the largest switch plate to have only one twisted pair cable connection via DALI or E-Bus to the lighting control system.

Operating Modes

SPECS Manager software can uniquely address each SPF.4D. The system can check that the SPF.4D has identified itself on the system and can program it to operate in different modes in the same fashion as the SPECS SPK.8 Intelligent Switch Plate.

Scene Mode

Scene mode can only be used with retractive switches; it is used to control one group of lighting to different scenes. Each of up to four buttons can be configured to select a scene or cycle between scenes in a predefined pattern.

Zonal Mode

Zonal mode can be used with retractive or conventional two position switches, it is used to control one group, or 'zone', of lighting from each switch. A short (retractive) or switch close (two position) can select any scene for the zone, it can also be configured to cycle or toggle on/off thereby achieving two way and intermediate switching using normal switches and only two wires. A long press or switch open is also programmable, typically it would turn lighting off.

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Installation Procedure

SPF.4D Labelling

Each SPF.4D is identified by a three digit unique number, this number should be used to ensure that each SPF.4D is fitted in the correct location as given on drawings.

This indicates that this SPF.4D can be used to interface up to four switches and should have five flying leads, one for each switch and one common.

This is the terminal block for the DALI or E-Bus connection. (Note that it is polarity sensitive, this still applies when connected to a DALI bus).



Connecting to the switches

It is important to connect the wires according to the number of switches fitted as indicated in diagrams below. Loop connect the black flying lead to one side of each switch as a common; if using only one switch terminate both black common wire ends in the same terminal. If SPD.4-D variant has more wires than is required for number of switch connections, then the remaining wires must be cut off close to case or individually insulated, ensure no electrical contact is possible. Insulating the spare wires option means they are available for future use if required.

ROCKER SWITCH STYLE	NON-ROCKER SWITCH STYLE				
SPF.4D-2	SPF.4D-4	SPF.4D-3	SPF.4D-2	SPF.4D-1	
SPF.4D-4					
WIRING COLOURS VIEWED FROM THE FRONT OF THE SWITCH PLATE					

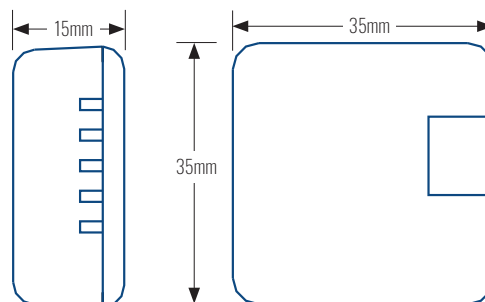
NOTE: Orange wire may be yellow on older units

General Specification

Supply:	Two wire combined FELV signal and supply for connection to DALI or SPECS E-Bus
Weight:	20g
Tamb:	0 to 40°C

Part No. Description

SPF.4D-4	Compact interface with flying leads for four switches.
SPF.4D-3	Compact interface with flying leads for three switches.
SPF.4D-2	Compact interface with flying leads for two switches.
SPF.4D-1	Compact interface with flying leads for one switch.



SPF.10 FLEXIBLE INTERFACE WITH LATCHING RELAY OUTPUT



- Four flexible addressable data inputs for SPECS system control.
- Interfaces to volt free contacts, retractive or conventional two position switches.
- Analogue inputs for potentiometer set point control.
- Isolated AC/DC input.
- Isolated changeover relay output.
- Custom enclosure with terminal covers, strain relief and LED status indicators.
- Flexible configuration via SPECS Manager graphical software.
- Simple FELV twisted pair cable bus connection.

The unit provides for the flexible connection of analogue and digital signals to the SPECS lighting control system. The unit also provides an uncommitted changeover relay output for controlling other equipment. Typical interface connections include:

- Audio visual systems
- Partition switches
- Air conditioning fan coil units
- Conventional and retractive (momentary) switches
- Potentiometer set-point control.
- General data gathering.
- Remote monitoring of disabled toilet alarms.

A variety of configuration options are provided by the SPECS Manager graphical software, for example the SPECS Manager graphical software, for example the unit can perform all the Scene and Zonal switch control functions available on the SPF.4 compact interface. Unused inputs may be used for other functions such as data gathering.

The unit is connected to the lighting control system using E-Bus, which provides both power and communication and is fully addressable having its own unique bus address.

The unit housing is fully enclosed and is suitable for mounting in most locations, end caps provide cable strain relief and may be removed to access mounting points and terminal wiring.

LED Status Indicators

When used with volt free inputs or switches each LED will come on when the respective input is connected to "Com" (Common). LED 4 has a dual function, as well as indicating volt free status it will 'blip' briefly every 1.5 seconds if the Relay Output is closed (NO terminal connected to Com). With analogue inputs referenced to Com (0-5VDC range) LEDs 1, 2 and 3 will emit a pulse inversely proportional to the analogue value. In pre-commissioned mode Status LED No.1 will flash to indicate correct connection.

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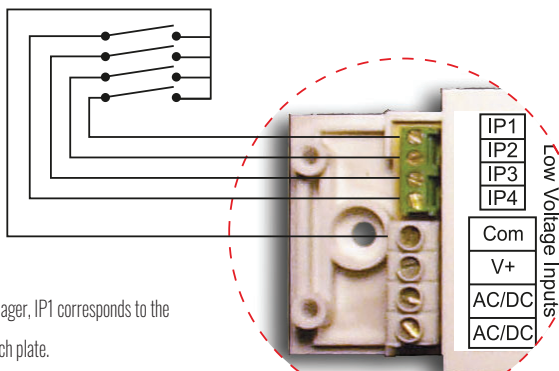
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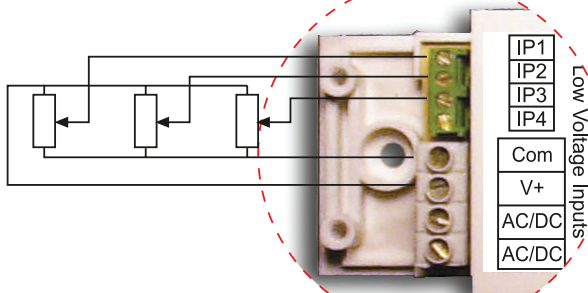
Wiring Options

1. Volt free switch inputs

Note: within the SPECS manager, IP1 corresponds to the bottom of a four button switch plate.

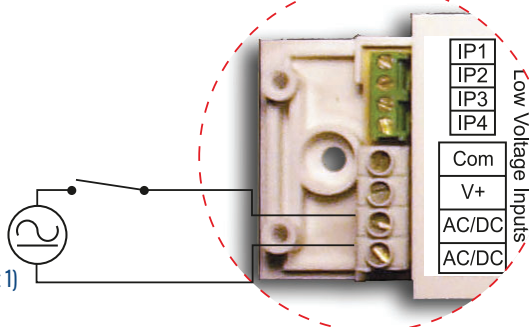


2. Analogue inputs



3. AC/DC Voltage input

(This input is shared with Input 1)

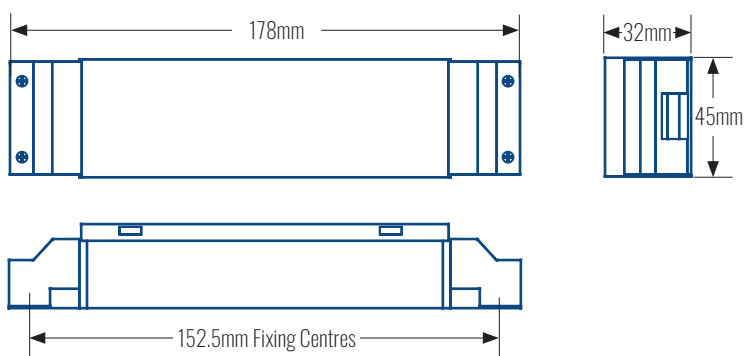
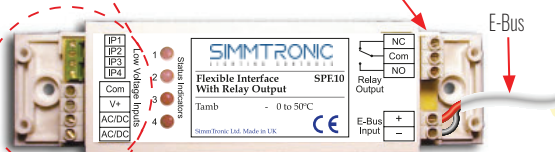


Controlling Fan Coil Units by Presence

The relay output of the SPF.10 can be used to set FCU's to 'close' temperature control when an area is occupied.

If an FCU input is closed to select close temperature control (occupied) then connect between 'Com' and 'No'.

If an FCU input is closed to select wide temperature control (vacated) then connect 'Com' and 'NC'.



General Specification

Relay Load:	3A, 240VAC, 50Hz Changeover.
Weight:	120g
Toggle Rate:	typ 2 seconds, with 16 second re-charge delay. (SPF.10 only)
Aux 'V':	+5V referenced to "Com",
Output:	2mA, Short Circuit protected.
Voltfree Inputs:	4 No earth referenced.
Analogue Inputs:	3 No 0-5V DC earth referenced.
AC/DC Input:	Isolated to 1000V, 12-47DC, 8.5-33VAC, AC/DC Voltage input is shared with input 4.

Part No.

Description

SPF.10	Flexible Interface with Latching Relay Output.
--------	--

INPUT OPTIONS

Input	Volt Free	Analogue	AC/DC
1	✓	✓	
2	✓	✓	
3	✓	✓	
4	✓		✓

SPL.2 EXTERNAL PHOTOCELL SENSOR



- Addressable External Photocell with IP65 enclosure
- Accurate colour corrected light measurement
- Wide range linear photodiode
- Flexible configuration via SPECS Manager graphical software
- Simple FELV twisted pair bus connection
- Self test LED indicator

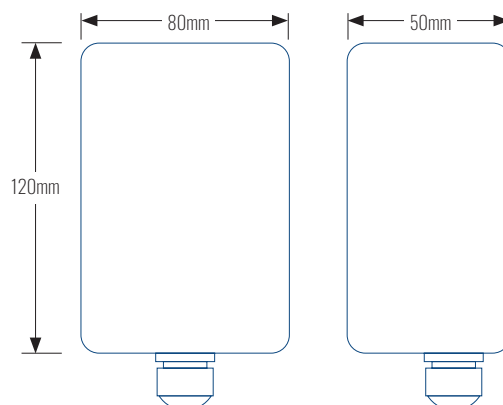
The SPL.2 is used to monitor the external sunlight condition. The unit is design to be roof mounted and has an IP 65 rating.

This unit simply connects to the twisted pair SPECS E-Bus, which provides both power and communication. The SPL automatically identifies itself on the bus and continuously reports its status on the bus and continuously reports its status and current readings.

SPECS Manager software can uniquely address any SPL and use its sunlight reading to control any group of lights.

Photocell Control

The SPL.2 utilises a silicon photodiode to provide accurate and linear colour corrected light level measurement over a wide 1000 to 1 range. The SPL.2 has a measurement range of 2,000 lux to 2 lux range with resolution of 2 lux. The sun light level reading may be configured to control any combination of lighting groups within the SPECS system. Each lighting group can have different switching thresholds.

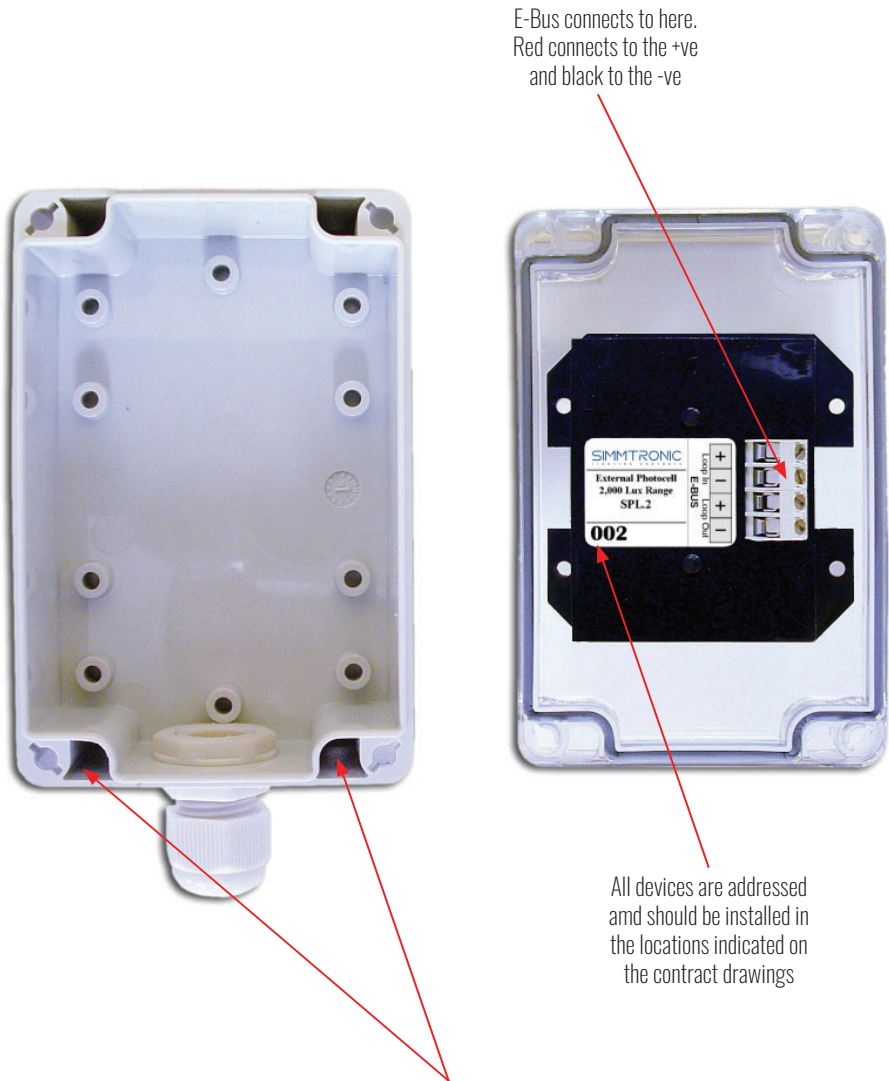


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Installation



Mount using the corner holes only as these are outside the IP65 seal. If any other holes are made in the casework, the waterproof seal will be compromised.

General Specification

Supply:	Two wire combined FELV signal and supply connection to SPECS E-Bus
Weight:	225g
View Field:	90 degrees

Part No.	Description
SPL.2	External Photocell

SPC.3020 INTEGRATED HEAD END PROCESSOR



- Complete Head End integration in one unit
- Freestanding and rack mountable
- Integrated battery backup
- Integrated temperature controlled cooling fans
- Integrated 24 hour operational data server

For high-end systems requiring Automated Emergency Testing or BMS Data Exchange, the SPC.3020 Integrated Processor Unit is provided. The SPC.3020 Integrated Processor Unit supports all available Simmtronic SPECS3 software, the SPM.300 SPECS Manager Graphical Software, Emergency Lighting Automatic Test System (ATS) and Building Management System (BMS) interfacing protocols. The SPC.3020 also has the capability to supervise SPC.2031 IoT gateway systems, for further information see the SPC.2031 IoT gateway datasheet. The SPC.3020 connects to the Lighting Area Controller T-Bus or IP network and if required, the building BMS LAN network. The unit contains an SPC.1000 SPM computer and the SPC.2000 24 hour operational Control Processor providing all front-end functionality in a single package. The SPC.3020 also contains a 15 minutes duration battery back-up which allows operation of the SPC.2000 Control Processor during mains interruptions, enabling a safe controlled shut down.

The SPM Manager's user Interface applications are implemented on the SPC.1000 SPM Computer in a familiar easy to use PC environment. SPC.2000 Control Processor is a high reliability processor designed for continuous 24-hour operation.

The SPC.3020 can be used as follows:

Rack: Supplied with mounting ears and rear brackets for 19" rack cabinet mounting, 2U height required. Users typically gain access to a rack mounted SPC.3020 remotely via the BMS LAN or via a client supplied rack KVM, keyboard, screen and mouse. A small screen, keyboard and mouse are supplied for SPC.3020 commissioning and servicing activities.

Freestanding: Supplied with 24" HD screen, keyboard and mouse; all interfaces and cables for stand-alone operation, suitable for desktop location or floor standing (with supplied foot).

If the SPC.3020 is connected to the building BMS network remote viewing of SPECS software is possible using the SPN.400 Networked Viewer software. Suitable PCs with Viewer software can be provided, contact Simmtronic sales for details.

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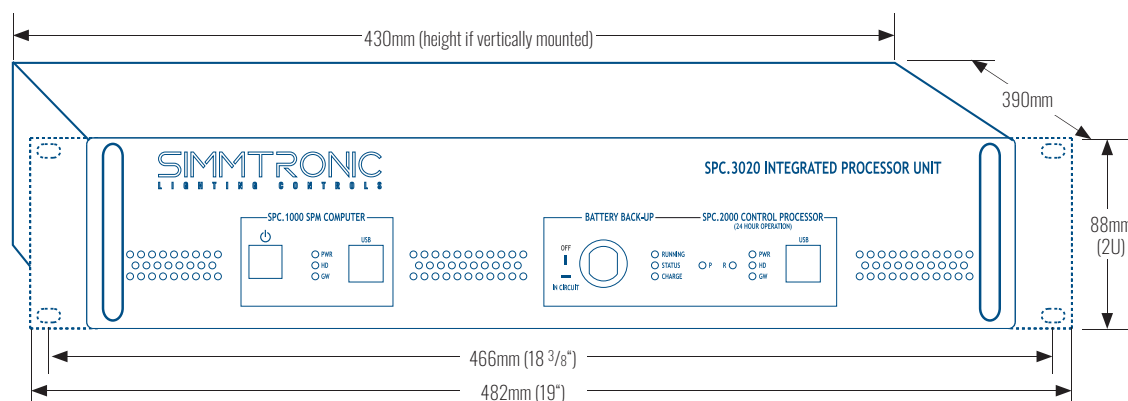
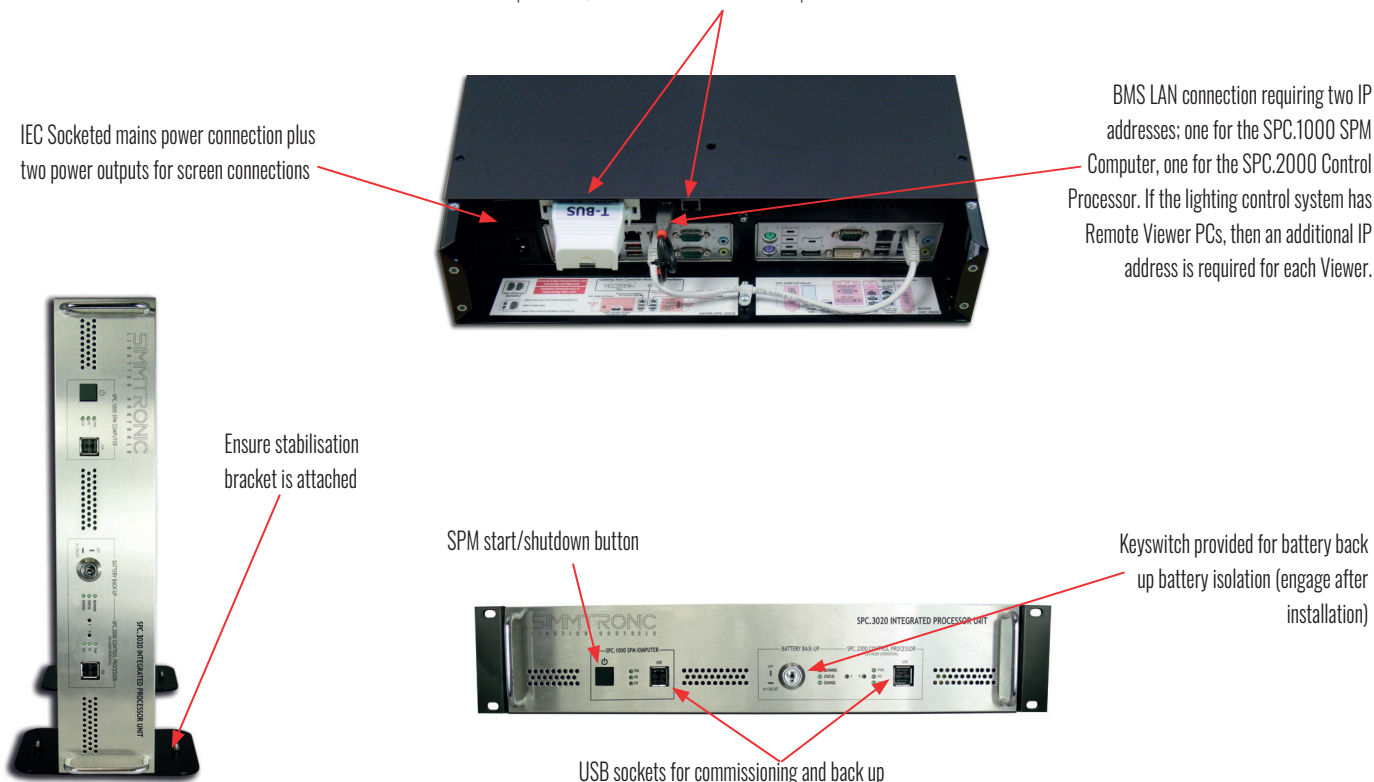
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Installation

The SPC.3020 is shipped to complete with instruction and cables for easy installation. All power, LAN, Simmtronic bus, screen, keyboard and mouse connections are on the rear panel of the SPC.3020. During commission and servicing of the SPC.3020 access to the rear panel is required with screen, keyboard and mouse connected. Commissioning of the SPC.3020 and the lighting control system are linked, final commissioning is conducted by Simmtronic commissioning engineers. The rechargeable batteries used for the SPC.3020 battery back-up have a design life of four years, actual life may vary depending on usage. Access to the case (lid removal) is required to replace the rechargeable batteries.

The SPC.3020 Integrated Processor Unit supports all varieties of Area Controller networks, Simmtronic T-bus, IP or mixture of IP and T-Bus. The choice of Area Controller Network is dependent on site requirements, Simmtronic can advise on the options.



Handles protrude 25mm from front panel.

When standing vertically ensure mounting bracket is used (width of bracket is 180mm)

General Specification

Weight:	9.0 Kg per Unit
Power:	80 W max
Electrical:	220-240 Volts 50Hz
Temperature:	5 to + 30°C ambient

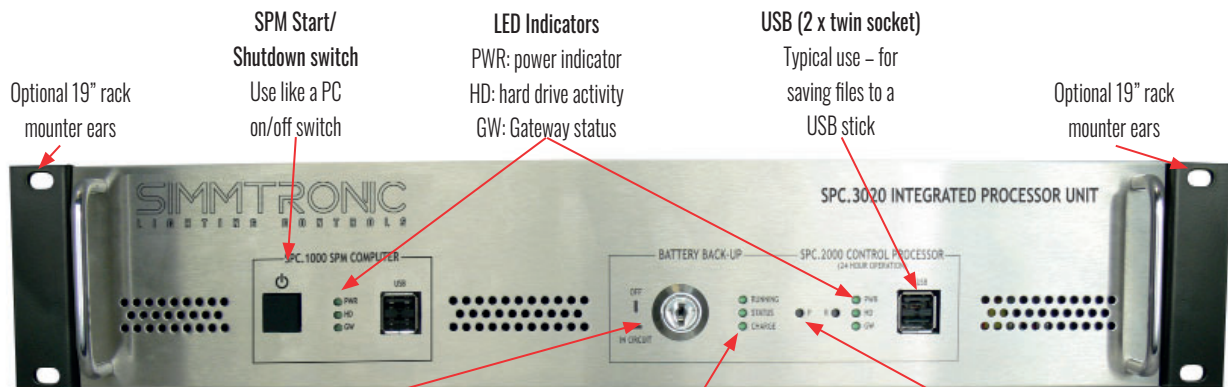
Part No. Description

SPC.3020-R	SPC.3020 Integrated Processor Unit with 19" rack mounting kit and cables
SPC.3020-FS	SPC.3020 Integrated Processor Unit with 24" HS screen, keyboard, mouse and cables

ISSUE E

SIMMTRONIC

SPC.3020 INTEGRATED PROCESSOR UNIT – ADDITIONAL INFORMATION



Key Switch

Off: for storage, transportation and when battery back-up not required.
In-Circuit: Battery back-up for SPC.2000 Control Processor for 15 minutes

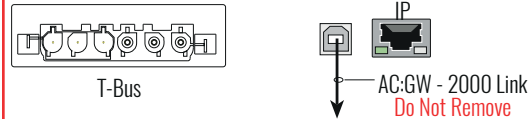
LED Indicators

Running: SPC.2000 powered from batteries
Middle: Status indicator
Charge: Flashing = Batteries charging
Solid = Charged

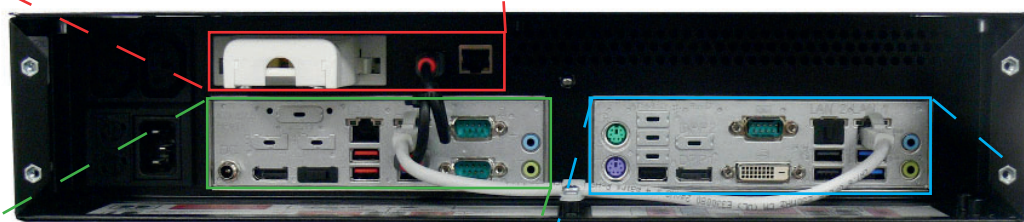
'P' & 'R' holes

Do not use except under Simmetric instruction

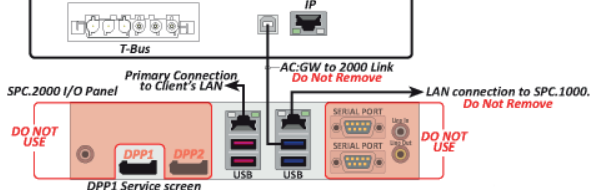
Lighting Area Controller Network Connections



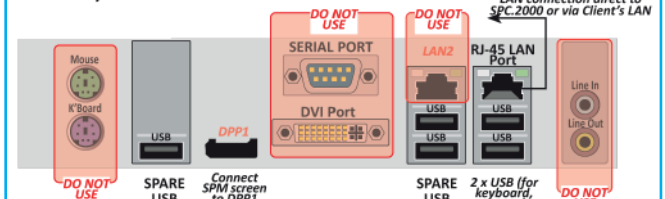
The SPC.3020 is shipped with 'ACGW-2000 (USB)' cable connected. Do not remove. Area Controller T-Bus network plug is supplied (not shown in picture).



Lighting Area Controller Network Connections



SPC.1000 I/O Panel



Notes

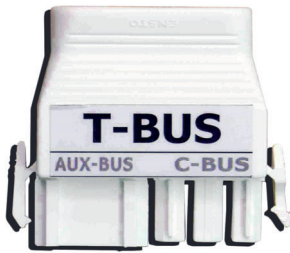
The SPC.1000 SPM Computer USB keyboard and mouse should be connected to the USB sockets on the rear panel of the SPC.3020. After connecting cables to the rear panel, it is recommended to re-fit the supplied cable guard in order to provide cable protection.

Area Controller T-Bus Network – Wiring Diagram for Head-End T-Bus Plug

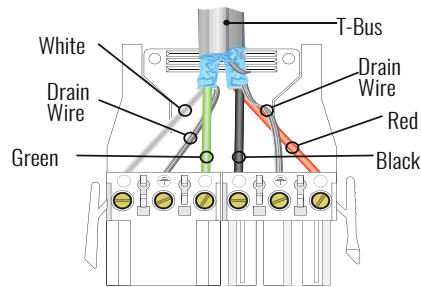
T-Bus plug is used for connection of the SPC.3020 Integrated Processor Unit to the Area Controller T-Bus (or Aux and C-Bus on retro-fitted systems) network.

Replacement T-Bus plugs are available from Simmtronic.

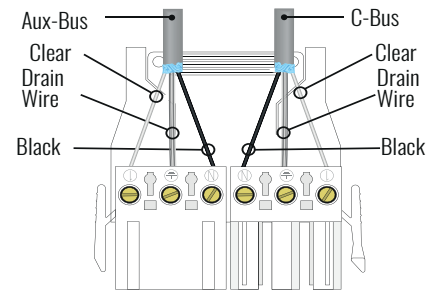
SPECS T-Bus cable, reference 2202PTFRH-E00 - Twin Twisted Pair, 2 x 2 x 22awg Screened, Grey, LSHF, is available from Simmtronic or F&S Cables (Tel: +44 (0)1727 840841, www.fscables.com).



Located at the rear of the unit plugged into socket



Plug Wiring details when using T-Bus as the Area Controller Network



Plug Wiring details when using separate Aux and C-Bus cables are used as the Area Controller Network

Installation Information

Battery Switch

Ensure the battery back-up switch is in the 'OFF' position when unit is not in use (intentionally disconnected from mains) and when being transported. A charge time of up to 24 hours is required before 15 minute rated back-up time for SPC.2000 Control Processor is achieved.

Connection and commissioning of SPC.3020

It is the responsibility of the installer to ensure the SPC.3020 is correctly located and connected; Simmtronic commissioning engineers can provide guidance. The final commissioning of the SPC.3020 will be completed by the attending Simmtronic commissioning engineer; the commissioning of the SPC.3020 and final lighting control program for the site are linked.

The following is general advice and instructions which may need to be adapted for particular site circumstances.

- The SPC.3020 is fully tested prior to packing and shipment and is ready for installation and commissioning.
- Ensure external connections to the SPC.3020 are available and ready for connection at the required location: mains supply, Area Controller Network (IP and/or T-Bus, check that mains voltage has not been accidentally connected to T-Bus) and BMS LAN (building management system LAN) connection, if required.
- The SPC.3020 is shipped with the direct LAN link between SPC.1000 and SPC.2000 I/O panels connected. This allows initial commissioning of the SPC.3020 without reliance on the client's LAN network.
- Connect screen, keyboard and mouse to SPC.1000 I/O panel - see Rear Panel Connection details overleaf.
- Connect mains power to SPC.3020; the SPC.2000 and battery back up circuit will automatically activate.
- The user interface of the Simmtronic lighting control system software is through the SPC.1000 SPM Computer. The standard configuration for the SPC.1000 SPM Computer has two users accounts. 'specs' for basic every day use of the software and 'simmtronic' a fully password protected computer administration account. Account access and password details are contained in the documentation package shipped with the SPC.3020.
- Pressing the SPM start/shutdown switch opens SPC.1000 SPM computer in the 'specs' account with out the need for password entry. A graphical interface provides easy access to lighting control system viewers, example Live Viewer and Emergency Test Viewer, and SPM software in a Windows environment. Note: functionality is dependent upon connection of a working Area Controller Network, T-Bus and/or IP LAN (with correctly configured IP addresses).
- A Java version prior to 8u211 is installed on the SPC.1000 SPM Computer, this is a license free product and provides all required functionality. More recent Java versions require a low cost annual license. If an update of Java is required for any reason, please contact Simmtronic.
- Full SPC.1000 SPM Computer functionality is available once the SPC.2000 Control Processor start up sequence has completed, this can take a short while.

SPN.200 DALI AUTOMATIC TESTING SYSTEM FOR EMERGENCY LIGHTING

The SPN.200 ATS tests stand-alone DALI emergency fittings, centrally-powered DALI emergency fittings and installations with a combination of both types.

DALI stand-alone emergency fittings

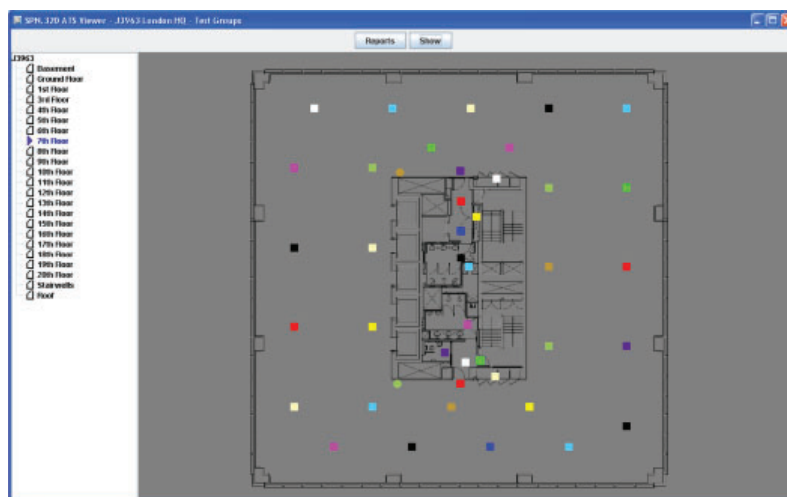
Using building CAD details, the SPECS3 system automatically generates sparsely distributed testing patterns so that adjacent luminaires are not battery-discharged in the same testing period, as prescribed in IEC62034. This ensures that areas are never placed at risk.

Far exceeding the basic self-test capability of DALI inverters, SPECS3 provides a powerful centralised Emergency Lighting Testing system with the following benefits:

- Fully automated labour saving system – no walk test requirement
- No emergency testing disturbance to building occupants
- 100% testing and automated centralised record keeping
- Rugged 24-hour central processor and Graphical User Interface
- Automatic repair and replacement identification and fault clearing
- In accordance with BS.5266 and IEC 62034
- Proven on advanced schemes with more than 4000 emergency luminaires
- Pattern based testing: Emergency lighting system never placed at risk
- Continuous pre-emptive monitoring between function and duration tests
- Highly integrated within powerful SPECS3 system - no additional bus networks
- Emergency luminaire tagging and tracking
- Detailed graphical user interface based on building CAD. Intelligent fault analysis, remedial action print-outs and work sheets

The following are examples of outputs available from the system:

The system automatically analyses the locations of all emergency luminaires and divides them into independent, mutually-exclusive test groups, ensuring that no adjacent luminaires are battery-discharged in the same testing period (test groups colour coded below).



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Full details of the testing history of each luminaire are recorded. Test report summaries are easily generated and hard copy records printed.

Area	Total	Pass Rate	Test OK	Out of Date	Not Tested	Faulty	Repaired
Basement	38	94%	36	0	0	1	1
Ground Floor	168	95%	161	0	3	2	2
1st Floor	38	100%	38	0	0	0	0
3rd Floor	38	100%	38	0	0	0	0
4th Floor	38	97%	37	0	0	0	1
5th Floor	38	100%	38	0	0	0	0
6th Floor	38	97%	37	0	0	1	0
7th Floor	38	97%	37	0	0	1	0
8th Floor	38	100%	38	0	0	0	0
9th Floor	38	100%	38	0	0	0	0
10th Floor	38	100%	38	0	0	0	0
11th Floor	38	100%	38	0	0	0	0

The system detects and intelligently analyses any emergency lighting faults, presenting a clear remedial action for each fault.

Area	Equipment	Status	Action
Basement	SPX 05, LCM 050D, Port 4, Inverter 2, Ballast 1	6: Function test failed	t Retest or replace
Ground Floor	SPX 33, LCM 3315, Port 1, Inverter 20, Ballast 11	13: Inverter in rest mode	k: Check wiring, replace gear
Ground Floor	SPX 33, LCM 3315, Port 1, Inverter 21, Ballast 10	59: Inverter Failed	e: Replace gear
6th Floor	SPX 0C, LCM 0C06, Port 3, Inverter 2, Ballast 1	2: Emergency lamp failure	b: Replace lamp
7th Floor	SPX 0F, LCM 0F02, Port 3, Inverter 2, Ballast 1	3: Battery duration failure	c: Replace battery
18th Floor	SPX 34, LCM 3433, Port 7, Inverter 0	3: Battery duration failure	c: Replace battery
20th Floor	SPX 35, LCM 351C, Port 1, Inverter 27	3: Battery duration failure	c: Replace battery
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 23	14: Inverter in emergency operation	k: Check wiring, replace gear
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 22	14: Inverter in emergency operation	k: Check wiring, replace gear
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 20	14: Inverter in emergency operation	k: Check wiring, replace gear
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 19	14: Inverter in emergency operation	k: Check wiring, replace gear
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 21	14: Inverter in emergency operation	k: Check wiring, replace gear
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 18	14: Inverter in emergency operation	k: Check wiring, replace gear
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 17	14: Inverter in emergency operation	k: Check wiring, replace gear
20th Floor	SPX 35, LCM 3510, Port 1, Inverter 27	14: Inverter in emergency operation	k: Check wiring, replace gear
Stairwells	SPX 31, LCM 3111, Port 1, Inverter 18	3: Battery duration failure	c: Replace battery

Faults and remedial actions can be displayed graphically against building CAD drawings enabling easy location for maintenance. Graphical job sheets can easily be printed for maintenance staff, showing the location of each fault and annotated with the required actions.

SPN 320 ATS Viewer - J3963 London HQ - Emergency Gear Faults

Reports Show

J3963

- Basement
- Ground Floor
- 1st Floor
- 3rd Floor
- 4th Floor
- 5th Floor
- 6th Floor
- 7th Floor
- 8th Floor
- 9th Floor
- 10th Floor
- 11th Floor
- 12th Floor
- 13th Floor
- 14th Floor
- 15th Floor
- 16th Floor
- 17th Floor
- 18th Floor
- 19th Floor
- 20th Floor
- Stairwells
- Roof

Symbol Key

- Fault/action highlighted
- Faulty
- Okay
- DALI Non-emergency Luminaire
- DALI LCM
- Non-DALI Luminaire, LCM or SPB
- SPX
- Master luminaire
- Slave luminaire
- LCM or SPB
- SPX

Device Status

Emergency luminaire
Luminaire at SPX 0F, LCM 0F02, Port 3, Inverter 2, Ballast 1

Duration test last carried out on 16/11/2008
Function test last carried out on 20/11/2008

3: Battery duration failure
Battery did not drive the emergency lamp for the full rated duration.

After replacing the battery, a duration test is required.

[Go to LCM](#)

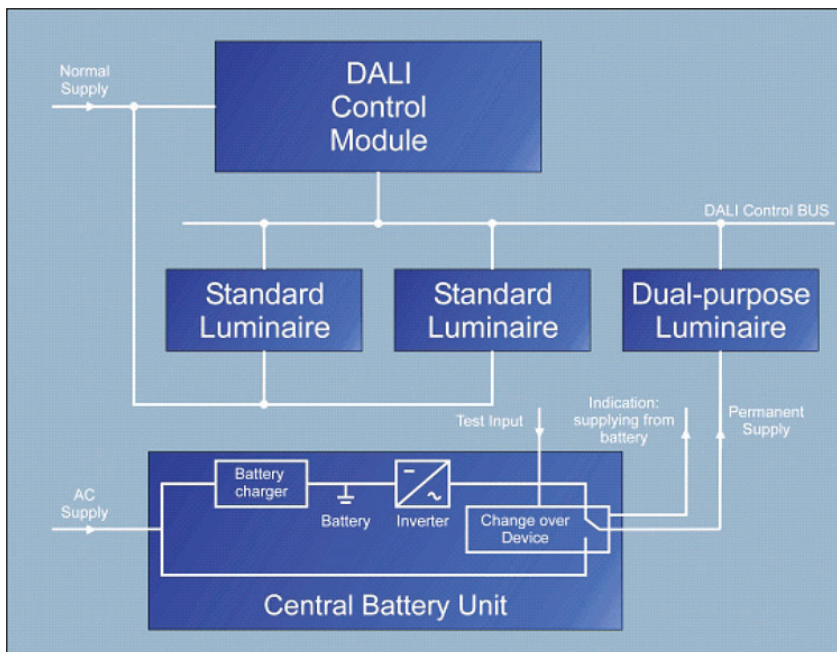
DALI centrally-powered emergency fittings

The SPECS ATS configures DALI emergency fittings that are powered from a Central Battery Unit (CBU) so that they will light automatically at pre-defined levels in the event of a power outage.

Using functionality built into every DALI-compliant fitting, each emergency fitting lights immediately and autonomously during a power outage:

- * no communication to the fitting is required, making emergency operation reliable and resilient;
- * no relays are required in the emergency fittings, reducing complexity and cost.

Typical system schematic



The SPECS ATS tests DALI emergency luminaires powered from any CBU conforming to EN.50171, for up to 240 CBUs per installation.

Highly integrated within the powerful SPECS3 system: tests are controlled using common DALI wiring - no additional bus networks or relays.

The ATS controls and monitors tests that are initiated using a CBU's self-test capabilities, ensuring that all appropriate luminaires are lit at their correct emergency levels throughout each test.

If a CBU has a volt-free test input, the ATS will also initiate tests - automatically scheduled regular function tests out of hours and on-demand testing.

ATS Status: Central Batteries		
Battery Unit	Operational Status	Test Status
Central Battery Unit 1	Lighting test - light levels checked	Lighting test time so far: 9 minutes
Show Status Details		

- * Far exceeding the test capability of relay-based emergency systems; compatible with dimming ballasts
- * Automated centralised record keeping
- * In accordance with BS.5266 and IEC 62034
- * Continuous pre-emptive monitoring between function and duration tests
- * Intelligent fault analysis, remedial action print-outs and work sheets.

SPN.400 DATA EXCHANGE SUITE

SPECS3 IP Data Servers provide data exchange with other building control and IT systems via open standard interchange protocols. Servers can be connected to T-Bus or IP Lighting Area Controller networks and provide TCP/IP support for multiple client connections. Servers provide interfacing via BACnet, MQTT and XML open protocols and can be integrated with industry-specific protocols such as OPC, LonWorks and ModBus via IP-based protocol gateways.

A primary function is the provision of fast presence data from the large distributed network of lighting control presence detectors, applications include:

- Control of heating, ventilation and air conditioning



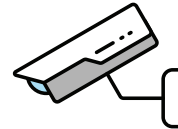
- Integration with room reservation systems



- Building wide occupancy monitoring

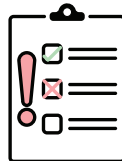


- Triggering of CCTV systems



Further primary functions, which can be tailored to specific requirements, provide:

- Fault status reports



- Lamp usage monitoring



- Energy usage monitoring

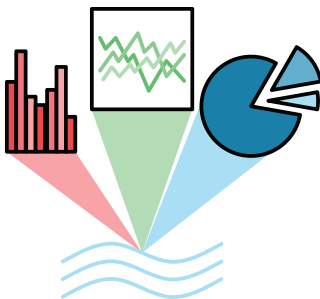


- System remote control



Big Data for Smart Buildings

The latest Smart Building deployments harvest and combine data from all control systems and use this to monitor building performance, optimise building utilisation and pro-actively manage maintenance.



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The lighting control system provides some of the most important data for Smart Building management - occupancy indications from every presence detector, plus light level readings from photocells and luminaire power levels.

SPECS provides all this information in the ideal format for data analysis - the MQTT open protocol (IEC 20922). Data is delivered on a 'change of value' basis to maximise responsiveness and minimise data storage and processing requirements.

Data is formatted in the JSON open format (RFC 8259) for ease of processing by IT systems. SPECS JSON formatting can be customised to assist in merging with data from other control systems.

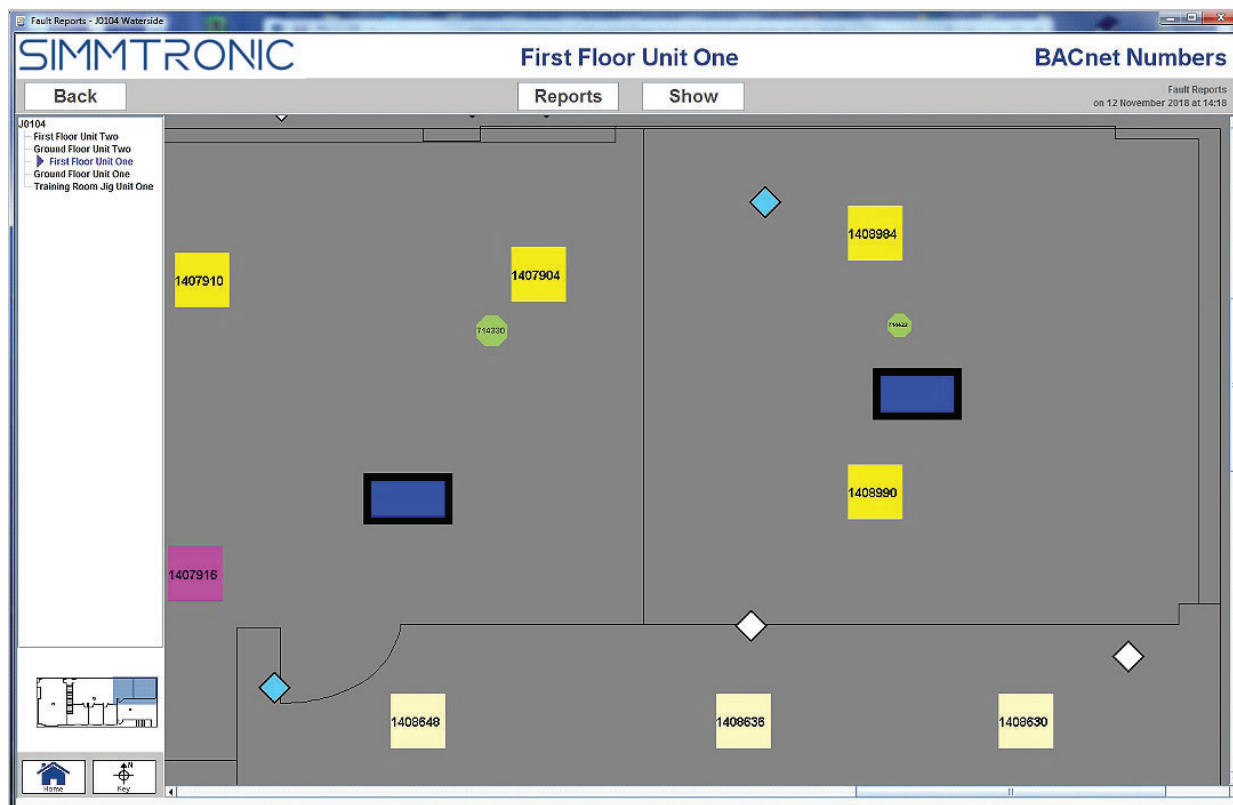
{“LightingDevice” :

```
{  “Timestamp” : “2018-07-26T18:21:54”,
  “Location”:
  {  “Area” : “Ground Floor”,
    “X” : 11450.4,
    “Y” : 6865.4 },
  “DeviceType” : “Sensor”,
  “Model” : “SPU.1”,
  “Operational Status” : “Normal”,
  “Presence” :
  {  “State” : “Active”,
    “InactiveTimeout” : 1200,
    “Units” : “Seconds” },
  “Light Level” :
  {  “Value” : 78,
    “Units” : “Lux” } }
```

BACnet Data Interchange

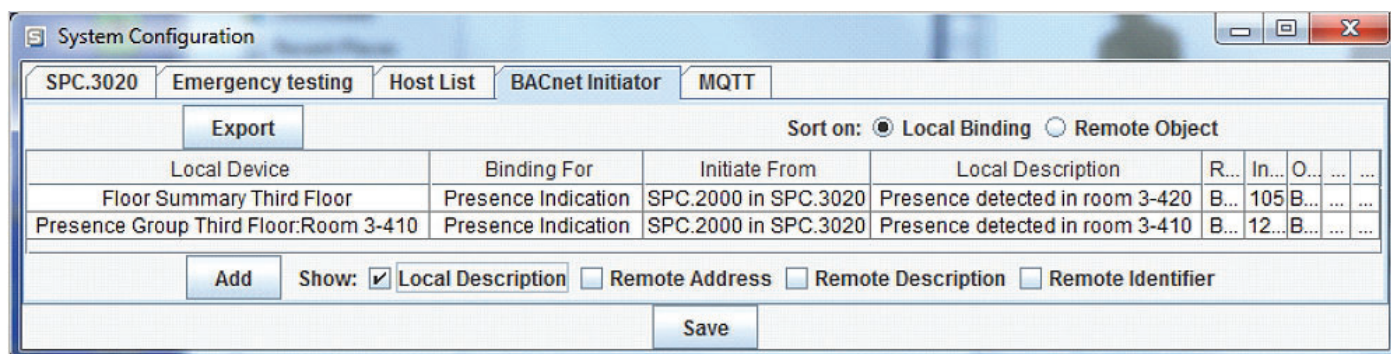
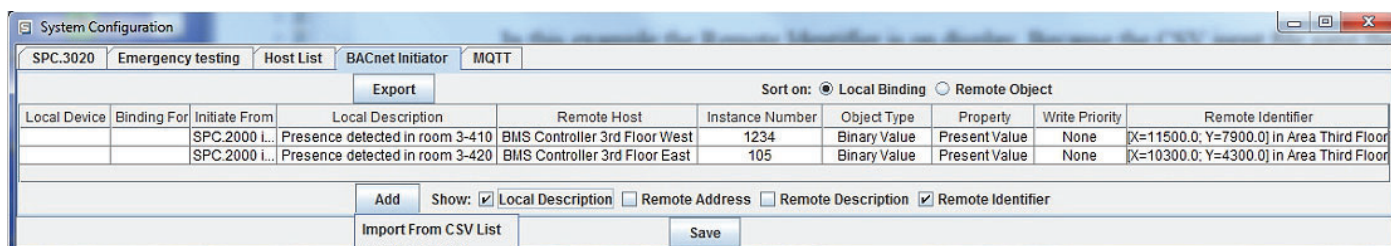
The SPECS BACnet interface allows other systems to send lighting control commands and to use status information from the lighting system. Lighting control commands are often used by AV systems that manage all the resources in a meeting room. Status information such as presence detection is used by a variety of other systems.

External systems can poll for a range of information. To manage the large number of data points available from a lighting system, SPECS provides both spreadsheets and graphical tools that assist in identifying the points that an external system needs to poll.



The SPECS BACnet interface can also write information into control points on external systems. This 'BACnet Initiator' mechanism gives greater responsiveness and efficiency than polling - events are notified to the external system as soon as they occur.

SPECS provides a range of tools to reduce the work in configuring and managing the external points or 'Targets'.



BACnet initiator objects are individually licensed within the SPECS system, contact Simmtronic sales for pricing information.

SIMMTRONIC MQTT PUBLISHER SUBSCRIBER

MQTT (Message Queuing Telemetry Transport) is an ISO Standard Network Protocol particularly suited to smart technology and the underlying need to efficiently exchange vast amounts of dynamic building-wide status information, to achieve enhanced building performance and utilisation.

Simmtronic's Powerful and Proven MQTT Solution comprises:

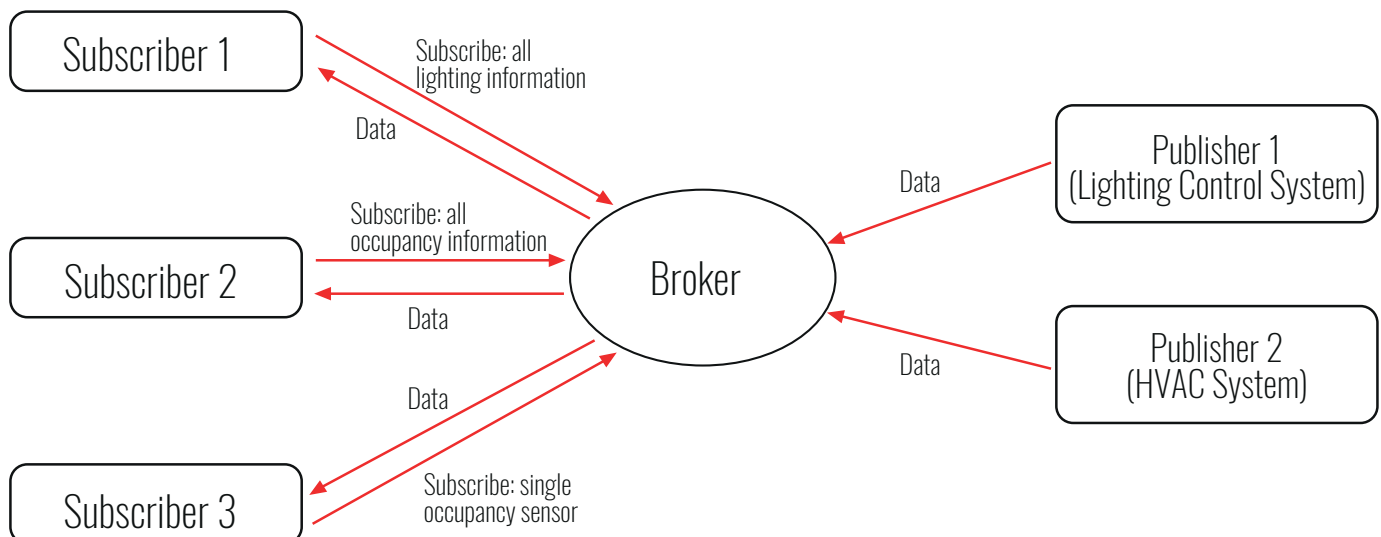
- Comprehensive Data Analysis
- Simmtronic Data Aggregation Architecture which enables rapid data provision
- API for lighting control
- Hosted on Robust Simmtronic SPC.2000 Control Processor with continuous operation
- Simmtronic MQTT Software Model publishes data directly without third party gateways

Comprehensive Analysis Data, available instantaneously, including:

- Lighting Levels
- Occupancy Status
- Energy Performance (when purchased with Simmtronic energy monitoring toolset)
- Device specific data for Area Controllers, Light and Blind Control Modules, Sensors
- Gear and Lamp Faults, Maintenance reporting

MQTT Data Flows

The MQTT Architecture consists of three entities: brokers, publishers and subscribers. The broker is an intermediary between publishers and subscribers. Publishers, such as the lighting control system, publish data to the broker about all the assets in their datasets. The broker retains the latest data published for every asset; publishers need to send data for an asset only when the data changes.



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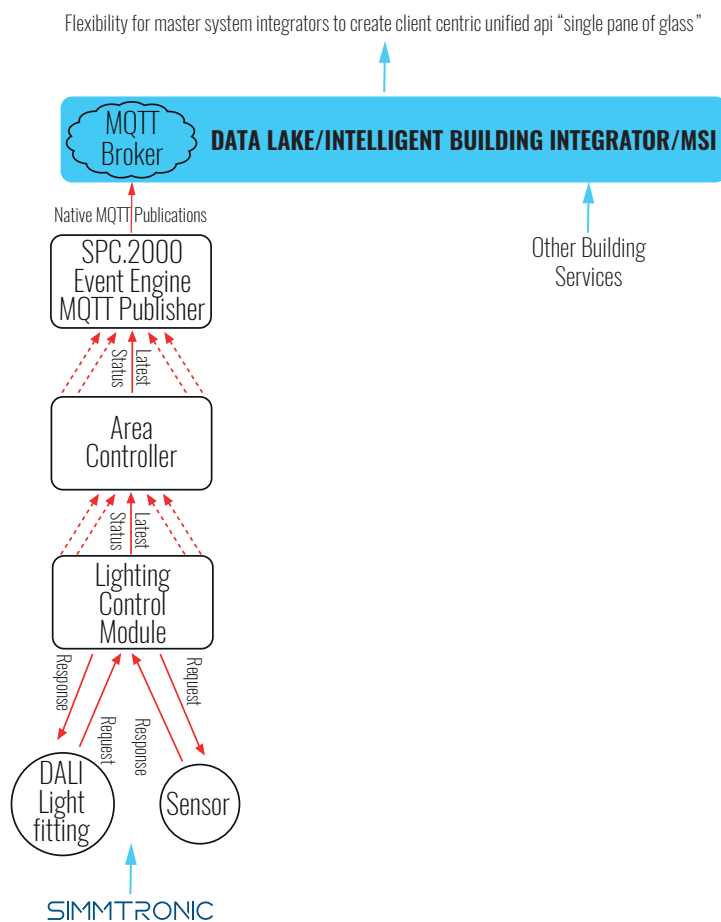
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Subscribers then subscribe to data relating to any or all of the assets, according to their needs. The example above shows three subscribers that have requested data about lighting control system assets: Subscriber 1 requesting data for all lighting assets; Subscriber 2 for all assets providing occupancy information; Subscriber 3 for a single occupancy sensor. As soon as a publisher sends updated information about an asset to the broker, the broker sends this information to every subscriber whose subscription includes that asset. So, in MQTT, messages are published and relayed only when data changes, often called 'event' or 'change-of-value' reporting. With many other protocols the consumer of the data must keep asking, or polling, to see if there are any changes, which is very inefficient. Publishing on change of event vastly increases efficiency and scalability, which is particularly important in systems with many data points, so that response rates do not degrade to unacceptable levels as a system grows.

Aggregation structure of the Simmtronic lighting control system (diagram below)

The data structure of the Simmtronic lighting control system is tailored to providing rapid MQTT data updates for every lighting asset.



Comparison between Simmtronic MQTT architecture and 'typical' MQTT architecture (diagram below)



Every Lighting Control Module continually collects data from every asset (sensors, light fittings) that it manages.

Every Lighting Control Module continually sends the latest data to its Area Controller.

Every Area Controller continually sends all this data to the SPC.2000. The Simmtronic IP Parallel Access architecture allows every Area Controller to send data to the SPC.2000 simultaneously.

The SPC.2000 includes an Event Engine that detects all changes of status in all assets. Each change of status produces an MQTT publication for the relevant asset.

The parallel data flow architecture shown above means that data is published immediately it changes. The Event Engine ensures that data is published only when it changes, making optimal use of MQTT's event-oriented data flows. The result is a complete lighting system data set for Smart Buildings that combines data transmission efficiency with very low latency.

This same Event Engine drives the graphical live status displays on a Simmtronic SPC Head End, providing users with comprehensive live information covering the entire installation.

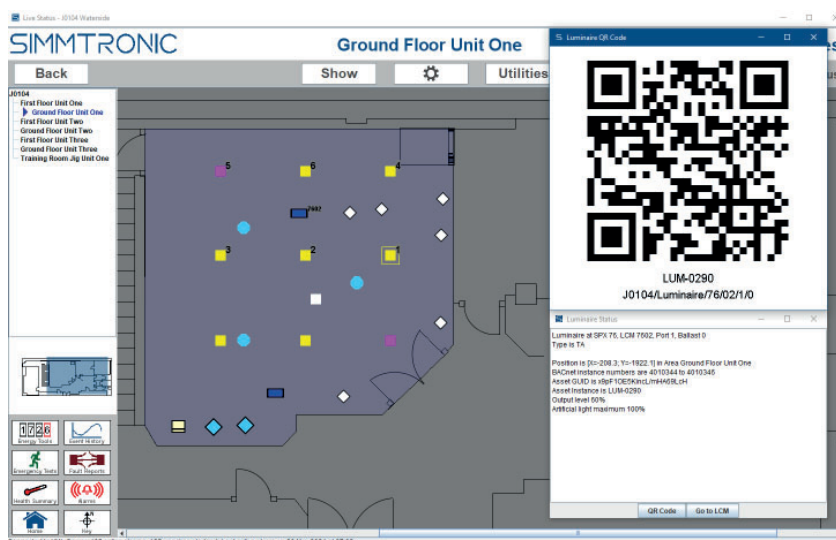
Rich Data Content

Data collected by Simmtronic Lighting Control Modules includes a wide range of inventory information, in addition to fault/status information and outputs from sensors. For DALI devices, information collected includes manufacturer and product model details, serial number, software version, device capabilities and optional features supported. For emergency light fittings, data provided via MQTT also includes latest test dates and test results.

This rich content is possible because MQTT support is native to the Simmtronic system. The Simmtronic MQTT publisher does not depend on gateways or protocol translators from lower level protocols.

QR Codes

Labels will be provided where required for fixing to lighting devices. QR codes for all lighting devices will be available at the lighting Head End, as example below.



In a smart building, all assets are assigned unique IDs. Large assets may have these IDs fixed to them in the form of labels with QR codes. This allows a maintenance technician to capture the ID onto a smart phone or other device, to allow replacement parts to be ordered. QR code capture ensures that the information is captured and forwarded without risk of typing errors.

In the lighting system:

- many of the assets are too small to affix labels to them;
- most faults are discovered from the lighting controls head end, not by looking at the equipment;
- much of the equipment is hidden in closets and false ceilings.

So the Simmtronic head end displays the same QR codes on its screen at the click of a mouse, again allowing IDs to be captured onto a smart phone or other device.

Key Benefits of MQTT

- MQTT is a lightweight protocol designed for responsive real-time data updates. Its event-oriented data flows reduce update times to seconds.
- MQTT is widely adopted and supported, with a robust ecosystem.
- MQTT features Internet-style data encoding that makes the data readily accessible to programmers with Database/IT skills.
- MQTT supports rich information content for ease of analysis that is not available using lower level protocols such as BACnet and KNX.

These lower level protocol examples (BACnet and KNX) have no standard representations for a timestamp, test date or product model and are unable to support the wide range of inventory information described above.

SECTION THREE

TENANTS

LANDLORDS

8th Floor

7th Floor

6th Floor

5th Floor

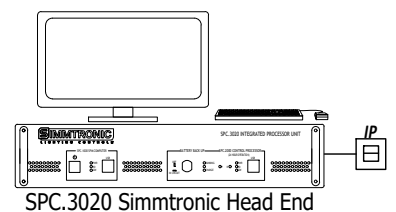
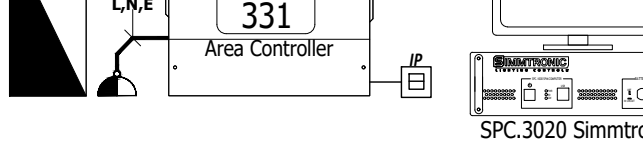
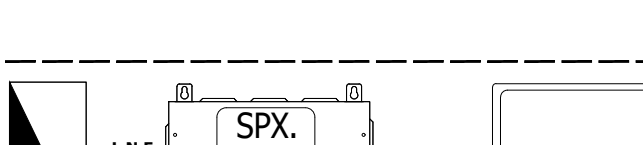
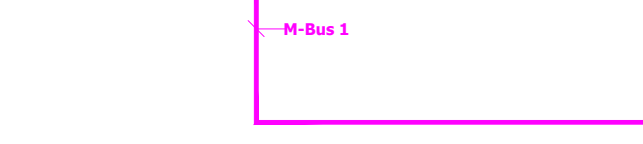
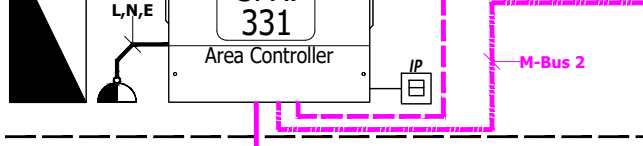
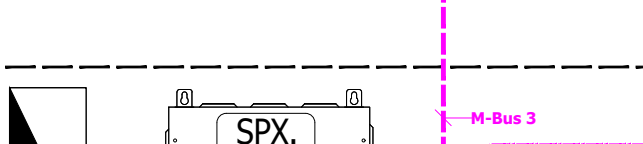
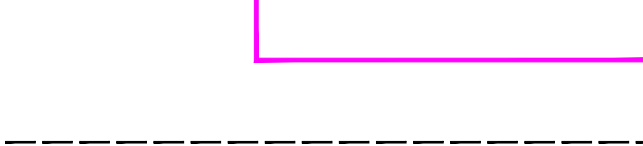
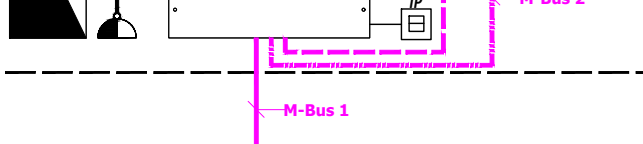
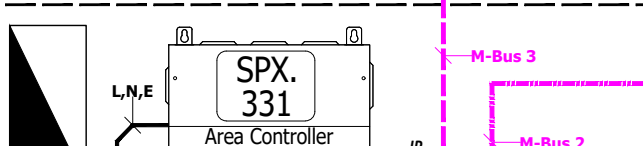
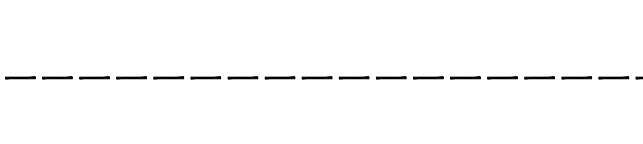
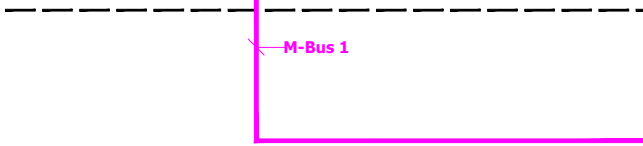
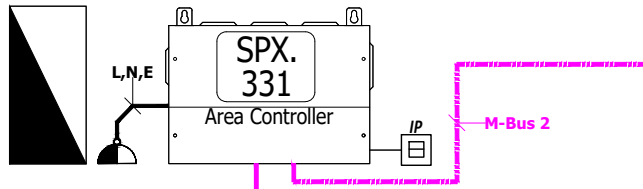
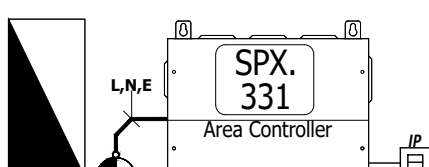
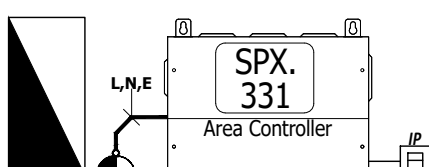
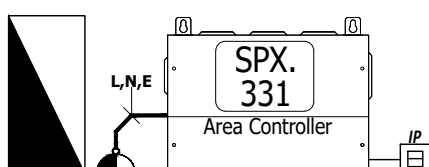
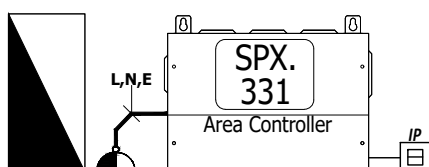
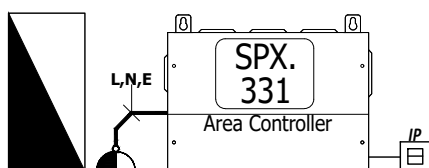
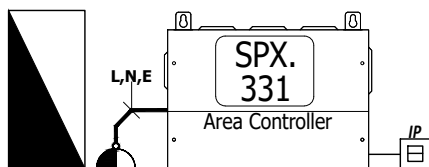
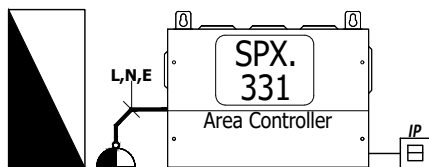
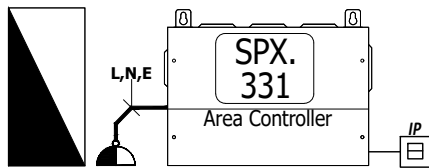
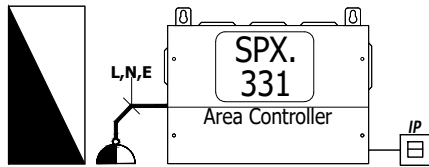
4th Floor

3rd Floor

2nd Floor

1st Floor

Ground Floor

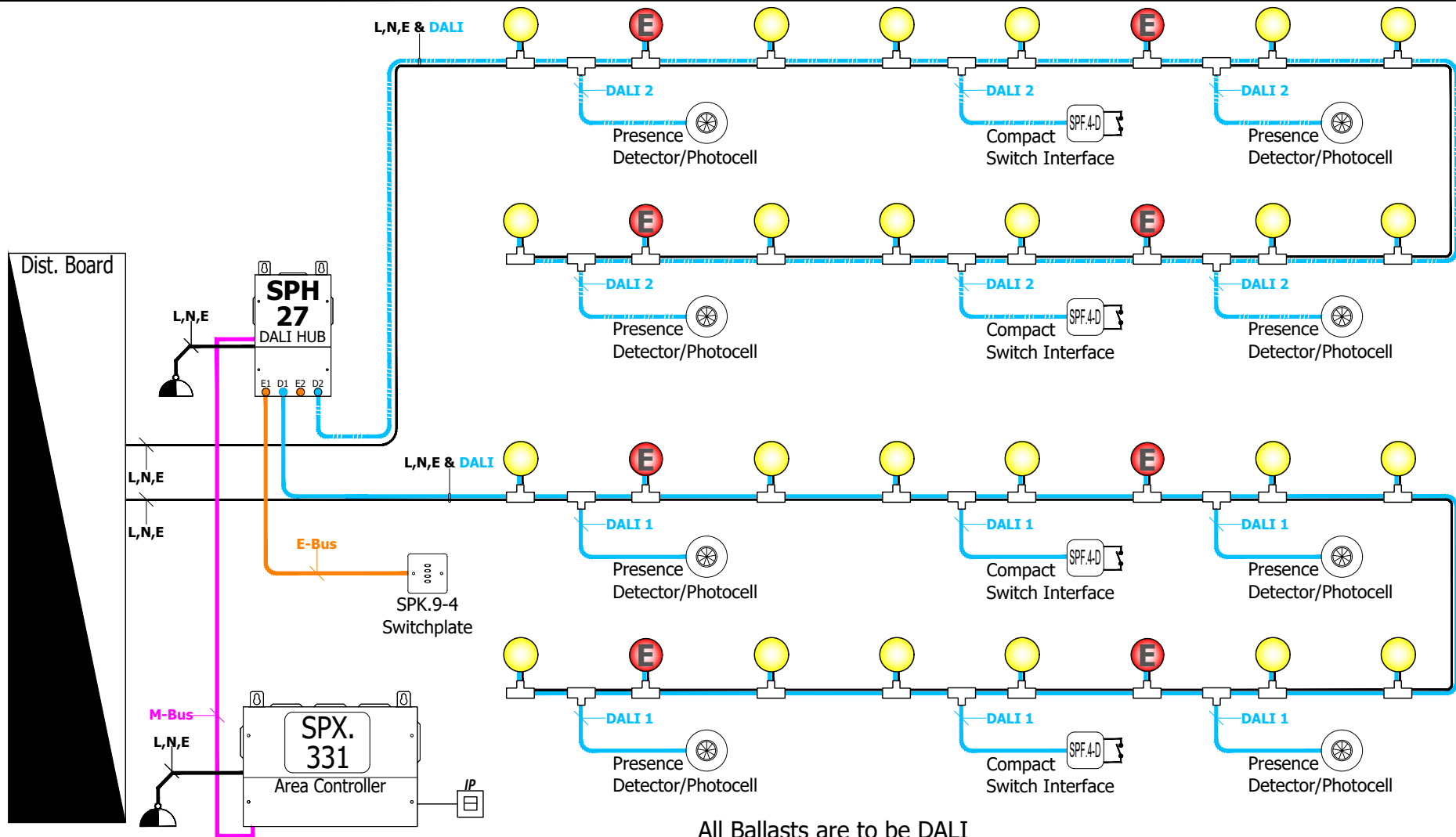


JOB NO: JTypSch
DRAWING: D01
ISSUE C
16/06/23

SIMMTRONIC SCHEMATICS SPX.331 Area Controller Network Schematic

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SIMMTRONIC
LIGHTING CONTROLS
TEL: 01992 450126
FAX: 01992 450127
E-Mail: office@simmtronic.com



All Ballasts are to be DALI

Emergency Luminaires to be provided with DALI Inverters where required

Max number of ballasts not to exceed 20 per DALI output

Max number of input devices not to exceed 12 per DALI/E-bus output

Maximum of 16 Hubs on an M-Bus Output

10 Maximum Emergency lights per feed

JOB NO: JTypSch

DRAWING: D01

ISSUE C

19/06/23

SIMMTRONIC SCHEMATICS

Typical SPH.27 LCM with SPX.331 Lighting Control Schematic & DALI Inverters

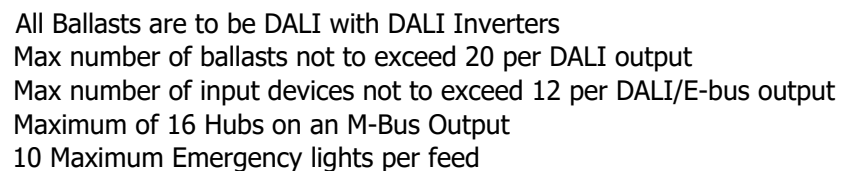
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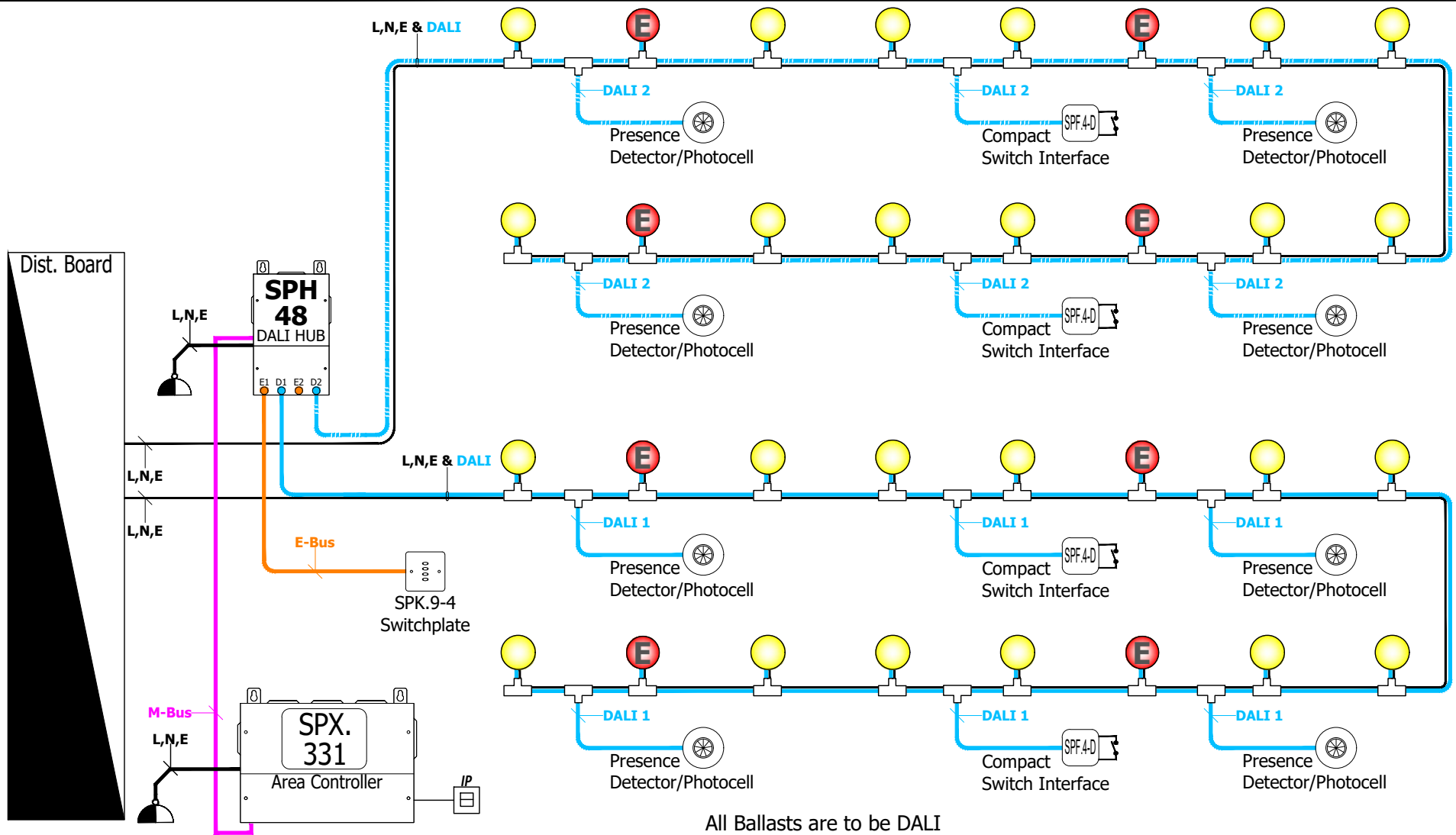
SIMMTRONIC
LIGHTING CONTROLS

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FAX: 01992 450127

E-Mail: office@simmtronic.com





All Ballasts are to be DALI
 Emergency Luminaires to be provided with DALI Inverters where required
 Max number of ballasts not to exceed 40 per DALI output
 Max number of input devices not to exceed 12 per DALI/E-bus output
 Maximum of 8 Hubs on an M-Bus Output
 20 Maximum Emergency lights per feed

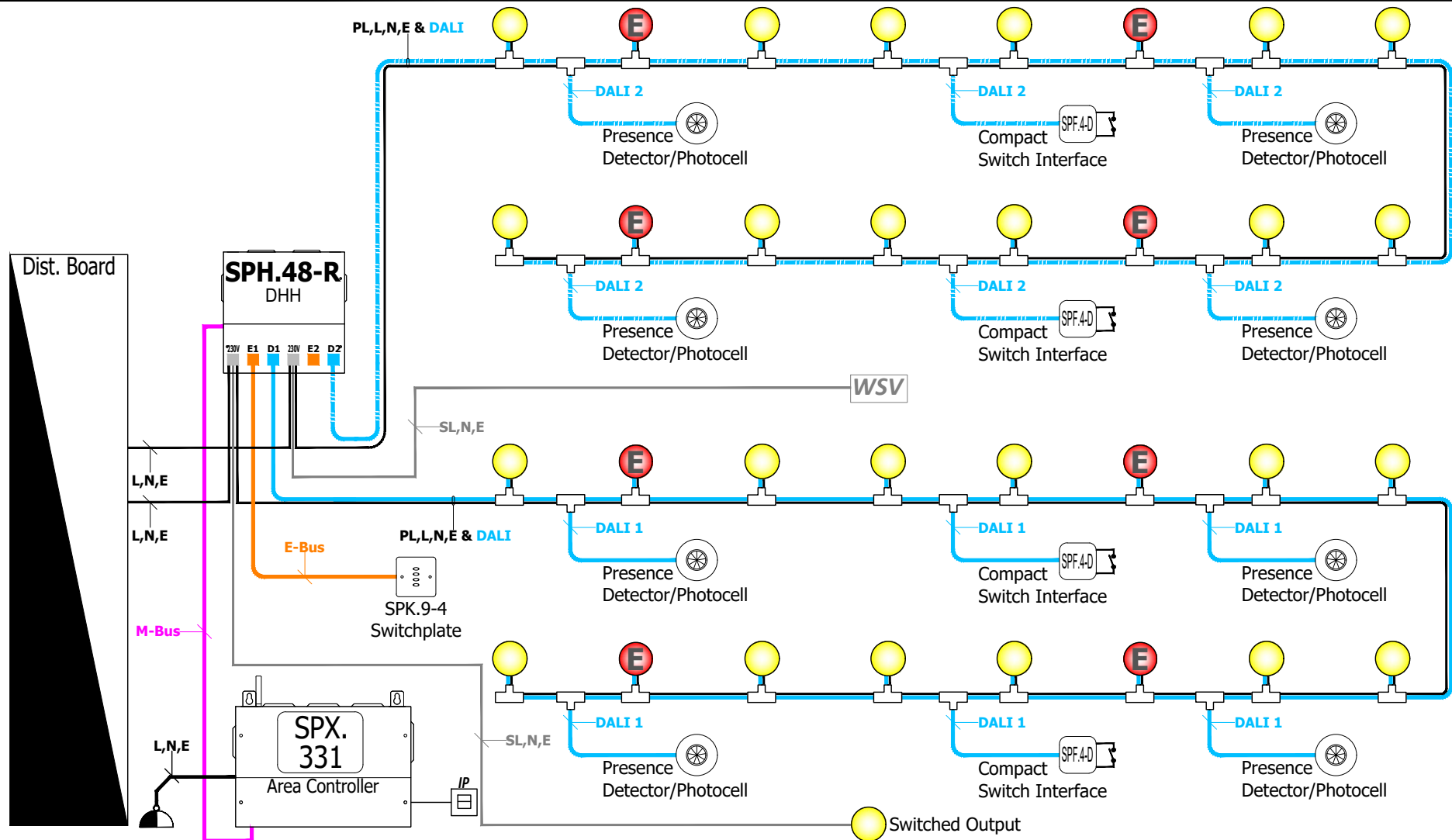
JOB NO: JTypSch
 DRAWING: D01
 ISSUE C
 19/06/23

SIMMTRONIC SCHEMATICS

Typical SPH.48 LCM with SPX.331 Lighting Control Schematic & DALI Inverters

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All Ballasts are to be DALI with DALI Inverters
 Max number of ballasts not to exceed 40 per DALI output
 Max number of input devices not to exceed 12 per DALI/E-bus output
 Maximum of 8 Hubs on an M-Bus Output
 20 Maximum Emergency lights per feed

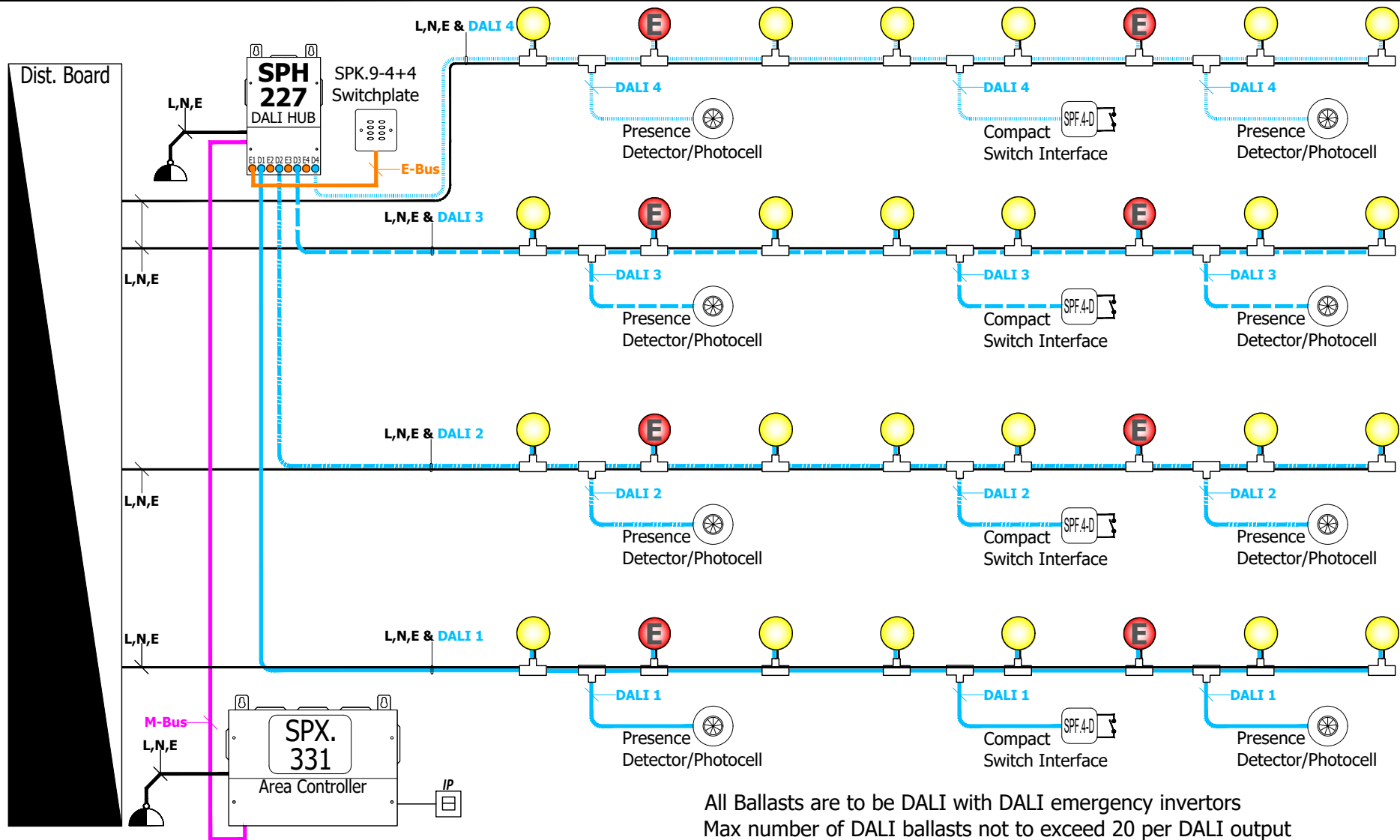
JOB NO: JTypSch
 DRAWING: D01
 ISSUE C
 19/06/23

SIMMTRONIC SCHEMATICS

Typical SPH.48R with SPX.331 Lighting Control Schematic & DALI Inverters

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All Ballasts are to be DALI with DALI emergency invertors
 Max number of DALI ballasts not to exceed 20 per DALI output
 Max number of DALI Invertors not to exceed 10 per DALI output
 Max number of input devices not to exceed 12 per DALI/E-bus output
 Maximum of 8 Hubs on an M-Bus Output
 10 Maximum Emergency lights per feed

JOB NO: JTypSch

DRAWING: D01

ISSUE C

19/06/23

TYPICAL SCHEMATICS

SPH.227 Lighting Control Schematic with SPX.331 & DALI Inverters

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SECTION FOUR

Commissioning

Prior to on site commissioning

Drawing Details

All equipment supplied is pre-numbered as part of the system application process.

Drawings are provided to ensure the correct location of each piece of equipment on site. Each equipment shipment is clearly labelled to show its intended location on site.

Periodic Site Visits during Installation

It is in the interests of all parties that the Simmtronic equipment is correctly installed. Whilst this procedure is detailed on instruction/schematic diagrams Simmtronic will, on request, visit site to offer guidance and deal with any particular problems that may arise. However, it should be noted that Simmtronic staff are not on site to install equipment, this being the responsibility of the electrical contractor.

Preparation of Lighting Control Configuration Software

Use of the system SPM software package to lay down device physical positions and addresses upon CAD generated drawings provided by the installing contractor. The configuration of the software connection between devices and luminaries in order to create the control regime detailed in the package. Note that this element is carried out away from site.

Prerequisites before on-site testing and commissioning

The following are required on site prior to the system being tested, programmed, and commissioned:

- Connection of all control bus wires to the Simmtronic area controllers will be completed. The controllers will have been energised and Sensor and Lighting Control Module connections will have been verified using the "Pre-commissioned Mode" tests as described in the installation guides.
- The pre-commissioned test mode allows the installing contractor to verify the correct communication connection between area controllers and lighting control modules by using the controller manual buttons to turn areas On and Off, this also allows verification that all light sources are properly connected and energised and may be turned On and Off by the system. It also enables the verification of switches and sensors by observing the flashing action of the device LEDs that will occur when correctly connected. DALI or DSI ballast dimming function can be proved by pressing the check and off/dim buttons simultaneously.
- All lighting control equipment should be energised from the permanent electrical supply together with the completed installation of all connected luminaries and light sources.
- Details of any changes or additions made to the proposed scheme shall be notified in writing, to Simmtronic, a minimum of 2 weeks before the commencement of on-site commissioning.

It will be necessary to access all areas where control equipment is installed; this includes the Simmtronic Area Controllers in electrical cupboards.

On site commissioning

The commissioning of the lighting control system consists of the following steps:

- Programming of the system in accordance with the control philosophy included in the package or as provided in writing by the consultant.
- Verification that all equipment is correctly installed with correct functional operation. Providing the installing contractor with report sheets detailing any installation issues enabling them to remedy any faults.
- Demonstrating and witnessing the installation as required by the package and subsequent issuing of a completion certificate.

Functional Verification, Programming and Testing Procedure

During the commissioning visit a portable computer will be connected to the system at one area controller and used to “scan” all bus cable connections. The computer will then compare the detected devices with the system prepared configuration file, any devices missing or incorrectly installed will be identified to the installing contractor for remedial action. Alternatively, this work can be carried out via a ‘Simmtronic Head End PC’ (where applicable).

Once the system is programmed, the function of each control device (switches and presence detectors) is checked, this includes the manual activation of all switch buttons and verification of the correct response of all lighting points.

If areas are identified where luminaires have been misconnected, they will be identified to the installing contractor for remedial action. Simmtronic will revisit any area once all remedial action is carried out, to complete commissioning checks.

Demonstration and Witnessing

As required by the package the system will be demonstrated to the witnessing authority.

Using a computer connected to the system and the SPM Manager software package, the control regime laid down will be reviewed using on screen graphics of the physical building layout, luminaires, and control devices.

Part or all of the installation will be scanned to verify the correct connection of all sensors and switches.

The system will be placed into “Run Mode” whereby an on screen view of the current lighting status is given showing luminaire and switch status together with presence detector and photocell values. This can be used to inspect selected areas and verify correct operation to the intended regime.

Notes

- A minimum of 2 weeks notice is required for commissioning.
- Up to date ‘**construction issue**’ drawings and a ‘**control philosophy**’ must be issued to Simmtronic, one week prior to any request for commissioning
- The installing contractor should issue Simmtronic with an agreed time program, showing commissioning periods and final completion date for each floor/area
- Simmtronic cannot be held responsible for any delays to completion as a result of insufficient commissioning time, due to issues beyond our control

Scene-setting & Lighting Control Philosophy

Issue A – 9th October 2021

All scene setting will be programmed as per the requirements of the specification. If it is not detailed within the specification, then Simmtronic will set up all levels as per the default Control Philosophy below unless notified otherwise.

If specialist lighting scenes are required, then the scene levels for these areas must be provided to Simmtronic by the Clients team at least 14 days prior to commissioning.

Emergency Lighting

- Emergency luminaires shall be connected to the DALI lighting control system to provide centralised automated monitoring and testing. The testing regime shall be as described in BS5266.

Fire Alarm Interface

- On receipt of a signal from the fire alarm all lighting will default to maximum level until the signal is removed

Operational Hours

- The main operational hours of the building will be 07:00hrs – 19:00hrs, Monday - Friday

Reception Areas

- All lighting shall default to the correct scene for the time of day.
- Lighting scenes (e.g. Morning, Afternoon & Evening) to be triggered by the astronomical timeclock.
- Scene setting plate in reception allowed for manual over-ride
- Scenes to be confirmed by the client's team

Lift Lobbies

- During operational hours, all lighting shall default to the correct scene for the time of day.
- Out of operational hours the Lift Lobbies will be controlled via presence detection.
- When presence is detected in the detector zone, all lighting in the lift lobbies shall immediately ramp up to the correct scene for the time of day
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.
- Lighting scenes (e.g. Morning, Afternoon & Evening) to be triggered by the astronomical timeclock.
- Scenes to be confirmed by the client's team

Stairs & Stair Lobbies

- When presence is detected in the detector zone, all lighting in the Stairs & Stair Lobbies shall immediately ramp up to the full lighting level
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.

Toilets

- When presence is detected in the detector zone, all lighting shall immediately ramp up to the full lighting level
- The detectors will also control the Toilet Water Solenoid Valves
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.

Core Corridors

- When presence is detected in the detector zone, all lighting shall immediately ramp up to the full lighting level
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.

Rooms/Offices with Retractive Switches

- Lighting switched on utilising the retractive switch by the door.
- On/Ramp up & Off/Ramp down
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.

Rooms/Offices with Scene-setting Plates

- Lighting switched on utilising the scene-setting plate by the door.
- Default scenes – 1. All 100%, 2. All 50%, 3 all 25%, 4 all off
- Scenes to be confirmed by the client's team
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.

Rooms/Offices with Presence detection only

- Rooms/Offices will be controlled via presence detection.
- When presence is detected in the detector zone, all lighting in the area shall immediately ramp up to on.
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.

Plant, Risers & Roof & Switch Rooms

- These rooms/areas are manually switched from a retractive switch beside the door, providing ON/OFF control of the lighting.

External /Terrace Lighting

- All external lighting shall default to the correct scene for the time of day.
- Between the hours of 0700 & 2300 Lighting scenes (e.g. Morning, Afternoon & Evening) to be triggered by the astronomical time-clock dependant on daylight levels. At all other times, the lighting will be off.
- Scenes to be confirmed by the client's team
- Scene setting plate in reception allowed for manual over-ride

Open Plan Office Areas

- Open Plan Office Area's will be controlled in groups up to 40m² via presence detection (if design allows)
- When presence is detected in the detector zone, all lighting in the area shall immediately ramp up to the full lighting level.
- After 20 minutes' inactivity, all DALI dimmable luminaires shall ramp down to fully off.

Daylight Dimming – Perimeter Lighting

- Photocell control will be set up on two rows of lights from the windows. Selected lights will dim according to daylight levels at the selected photocell sensors.
- Lights will dim to a minimum level of 5%

Notional/Security Corridor Route

- The Open Plan Areas Corridor Route will be controlled via presence detection.
- When presence is detected on the floor, all lighting shall immediately ramp up to the full lighting level
- 10 minutes after the last group has timed out all DALI dimmable luminaires shall ramp down to fully off.

Notes:

- Any Non-DALI/switched luminaires can be nominated as on/off within the scene but cannot be dimmed

SECTION FIVE

SIMMTRONIC INSTALLATION REQUIREMENTS

Ensure Simmtronic equipment is installed as below, otherwise Commissioning delays will occur.

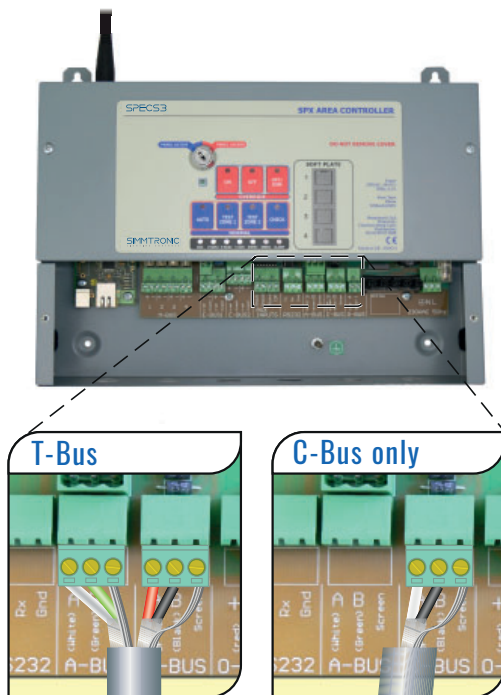
All relevant Area Controllers (SPX) should be installed & powered up.

All relevant area controllers should be connected to the Simmtronic area controller network by either “C- Bus” or “T-Bus” (see below).NB. T-Bus is a twin twisted pair cable, one pair connected to C-Bus and one connected to A-Bus.

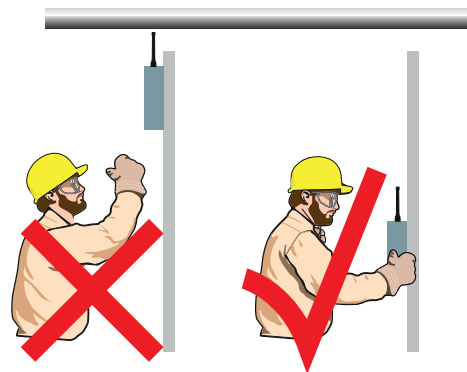
INSTALLING SPX AREA CONTROLLERS

Fit all SPX area controllers accessibly at or below shoulder height (see below) and feed each from its own labelled breaker. If the Area Controller comes fitted with an aerial ensure any adjacent metal work is at least 200mm away from aerial. It is necessary to have easy Tenant access to the area controller Test buttons.

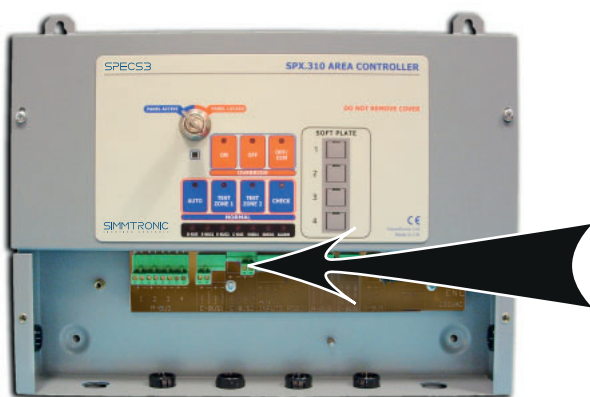
If using Mainsbourne communication the area controllers must be powered from the same board which directly feeds lighting modules whose 4 digit address begins with the two digit SPX number e.g. SPX Number 04 to board feeding LCM 0400 0401 etc.



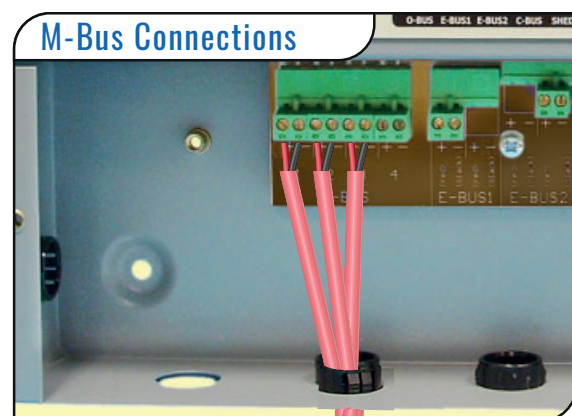
SPECS C-Bus cable 2201POFPH (LSZH), T-Bus cable 2202PTFRH (LSZH) are available direct from Simmtronic or FS Cables (01727 840841).



All Lighting Control Modules to be installed as shown on the Simmtronic drawing & powered up.



All Lighting Control Modules to be connected to their appropriate Area Controllers (SPX) by “M-Bus”. Please note that the maximum capacity of LCMs per M-Bus on the Area Controller (SPX) is 32 devices. The Area Controller has 4 M-Bus inputs.



SPECS M-Bus cable 1801PUYH-07 (LSZH with pink sheath) available direct from Simmtronic or FS Cables (01727 840841).

Continues Over...

All luminaires to be plugged in to their relevant Lighting Control Modules as shown on the Simmtronic drawing.

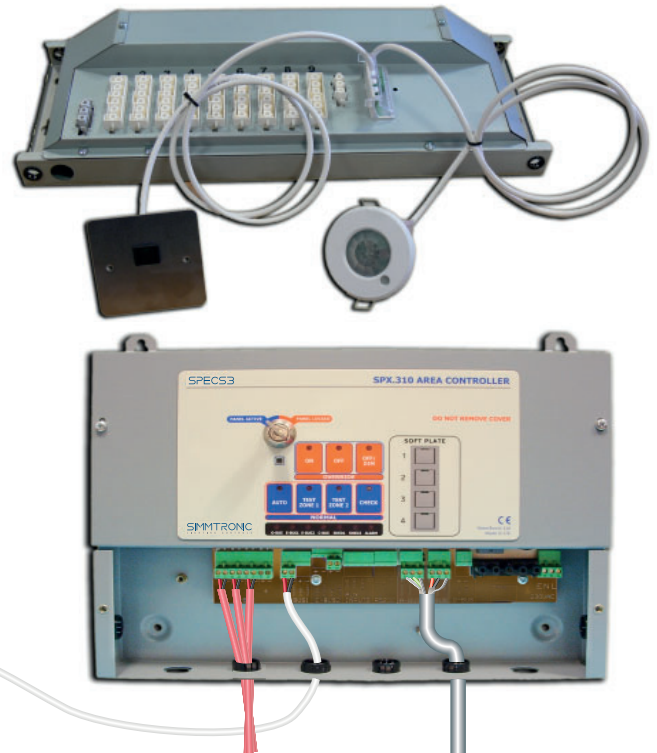
All control devices e.g. switches, presence detectors to be installed & connected to the Simmtronic system by “E-bus”. Connect the E-Bus as shown, **Red** goes to ‘+’ and **Black** goes to ‘-’.

SPECS E-Bus cable 1801PUYH-4 (LSZH with white sheath) available direct from Simmtronic or FS Cables (01727 828828).

In the case of local “E-bus” (connected to lighting control module) 10 No. devices per pluggable Lighting Control Module or 12 No. devices per hard wired module are permissible.

With direct “E-bus” (connected to the Area Controller) 64 devices are permissible, as well as 128 Simmtronic emergency monitoring devices (SPEs). (This may vary depending on devices used).

E-Bus into LCMs



E-Bus into SPXs

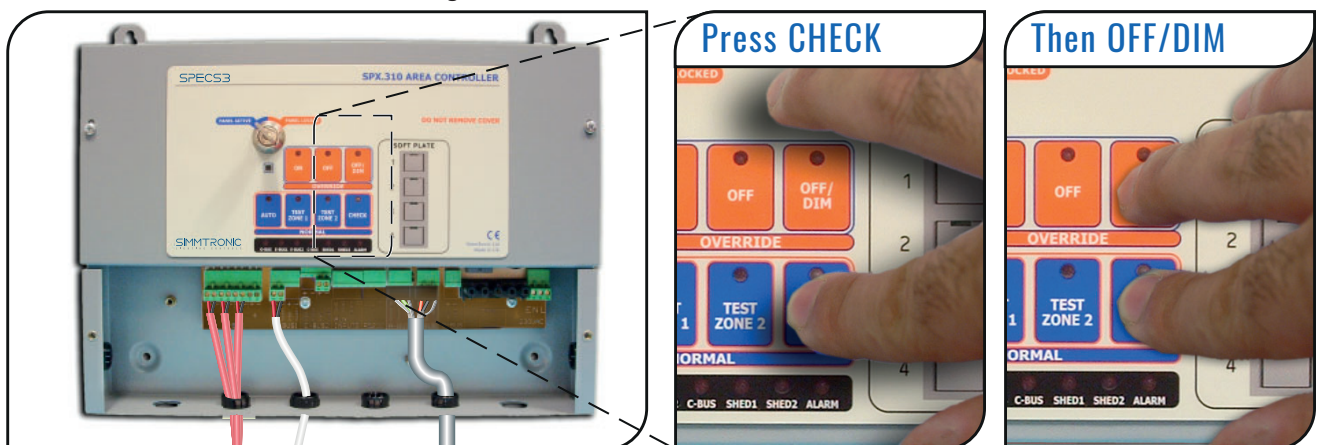


Simmtronic Pre-Commissioning Requirements

Prior to Simmtronic attending site it is possible to carry out basic checks from the Area Controller(s) using the touch buttons on the front panel.

Pressing the OFF or ON button will turn off, or on all the luminaires plugged in to Lighting Control Modules connected to the relevant Area Controller. This checks that the “M-Bus” is correctly installed.

In the case of dimmable luminaires, hold the CHECK button & then press the OFF/DIM button. All dimmable luminaires will now dim to their minimum light level. This check is essential with DALI sub addressed luminaires, if the luminaires do not dim they cannot be controlled or addressed or commissioned. Check DALI bus wiring.



With the Simmtronic system powered up & in any of the modes above, all control devices will have a flashing L.E.D. This checks “E-bus” connections.

CABLE SPECIFICATIONS

All twisted pair cables shall be in accordance with IEC60189-2 and be able to withstand 2.5kV DC between any conductor and the outer sheath. The quoted SPECS cables are available direct from Simmtronic or FS Cables (Tel: 01727 840841).

E-BUS CABLE

LSZH, Ø 6.0mm, 1801 PUYH-01-E00 (Blue Sheath)
RAL 5024 RAL 9010
LSZH, Ø 6.0mm, 1801 PUYH-04-E00 (White Sheath)



for connection of switches and sensors.
Blue is suitable for use as a DALI pair.

General Specification

Cable : 1 Twisted Pair.
Conductor : 16 x 0.25mm stranded tinned copper wire.
Section : 0.80mm², 18 AWG.
Colour coding : RED, BLACK.
Sheath : White or Blue 0.8mm thick.
Diameter : < 6.0mm overall.
Screen : none
Drain Wire : none
Nylon packing : Optional
Capacitance : 60pF/m between conductors.
Loop Resistance : 4.5Ω per 100 metres
Voltage Rating : 450/750Vac

Suitable Types : SPECS E-BUS CABLE-
LSZH, Ø 6.0mm, 1801 PUYH-01-E00 (Blue Sheath)
LSZH, Ø 6.0mm, 1801 PUYH-04-E00 (White Sheath)

M-BUS CABLE

LSZH, Ø 6.0mm, 1801 PUYH-07-E00 (Pink Sheath)



for connection of LCMs.
Also suitable for O-Bus.

General Specification

Cable : 1 Twisted Pair.
Conductor : 16 x 0.25mm stranded tinned copper wire.
Section : 0.80mm², 18 AWG.
Colour coding : RED, BLACK.
Sheath : Pink 0.8mm thick.
Diameter : < 6.0mm overall.
Screen : none
Drain Wire : none
Nylon packing : Optional
Capacitance : 60pF/m between conductors.
Loop Resistance : 4.5Ω per 100 metres
Voltage Rating : 450/750Vac

Suitable Types : SPECS O-BUS/M-BUS CABLE -
LSZH, Ø 6.0mm, 1801 PUYH-07-E00 (Pink Sheath)

T-BUS CABLE

LSZH, Ø 5.2mm, 2202-E00 PTFRH (Grey Sheath)



for inter-connecting area controllers, IOT Gateways (SPC.2031) and Head End Processors (SPC.1020, SPC.3020, SPC.2030).

General Specification

Cable : Twin Twisted Pair
Conductor : 7 x 0.25mm stranded tinned copper wire.
Section : 0.35mm², 22 AWG.
Colour coding : RED & BLACK for C-Bus, WHITE & GREEN for A-Bus.
Sheath : Grey
Diameter : < 5.7mm overall.
Screen : Individual and overall foil
Drain Wire : Yes.
Overall Drain : Optional
Loop Resistance : 10.8Ω per 100 metres
Voltage Rating : 450/750Vac

Suitable Types : SPECS T-BUS CABLE-
LSHF, Ø 5.5mm, 2202PTFRH-E00

C-BUS CABLE

LSZH, Ø 4.6mm, 2201 POFPH-E00 (Grey Sheath)



for inter-connecting of area controllers and PC gateway (Legacy Systems).

General Specification

Cable : 1 Twisted Pair
Conductor : 7 x 0.25mm stranded tinned copper wire.
Section : 0.35mm², 22 AWG.
Colour coding : CLEAR, BLACK.
Sheath : Grey
Diameter : < 4.7mm overall.
Screen : Foil
Drain Wire : Yes.
Loop Resistance : 10.5Ω per 100 metres
Voltage Rating : 450/750Vac

Suitable Types : SPECS C-BUS CABLE-
LSZH, Ø 4.6mm, 2201 POFPH-E00

Part numbers with suffix -E00 denote cable is marked and complies to LVD (2006/95/EC) and CPR (305/2011). CPR classification Eca (EN50575:2014+A1:2016). RoHS2 compliant. Cable identification and CE information is printed on cable sheath every metre. Minimum bend radius of cables, 10 x overall diameter.

LCM NUMBERING SYSTEM

When lighting control modules (LCMs) are put onto drawings it is important to label them with some kind of reference number. Each Simmtronic LCM has its own four digit unique address which will be marked on each LCM when shipped, this same number is used to configure the lighting control system. Consequently if the LCM drawing numbering system uses the LCM address system then a quicker, more efficient and traceable installation is assured. This technical note illustrates how to use the Simmtronic LCM address system for LCM labeling.

In any installation there may be several SPX area controllers which will be networked together. Each SPX has a two digit address e.g. 01 which uniquely identifies it on the system. This two digit address will be the same as the first two digits of all the LCMs controlled by that SPX, for example SPX 01 controls LCMs 0100, 0123 and 0145 but not 0201. For each installation Simmtronic will advise which areas will be controlled by each SPX and which two digit addresses they will use.

The LCMs can then be numbered on the drawing with their second two digits according to the sequence below. This numbering system is called "HexaDecimal" or "Hex" which just means that each digit has 16 possible values including A,B,C,D,E,F rather than 10 as with Decimal. For example 011F is a Hex number.

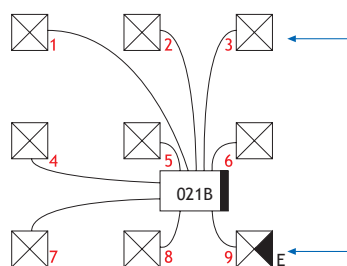
LCM Hex Address Numbering Sequence (last two digits)

Reading left to right, top to bottom. (Values greater than 7F are not valid).

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F
20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F 50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F

Having numbered each LCM it is necessary to show which luminaires are connected to it, or in the case of a Dali Hub how the luminaires are sub-addressed. As an SPV type LCM has ports that are individually addressable, its luminaires don't need subaddressing. Therefore the number shown is the port number that the luminaire should use; for example an SPV type LCM has 9 ports as illustrated below. Ensure all luminaires are connected and labelled including emergency exit signs if they are to be fed from the LCM. It is also useful to choose a port numbering convention, left to right, top to bottom, as used below seems natural, this has two advantages: Firstly the port numbers can be quickly entered into the lighting control configuration using step and repeat tools. Secondly if any port numbers are omitted then the installer can make a good educated guess which just needs to be confirmed later. Note that when load shedding is required the system default is that ports one and five will power up first and these should be used for essential lighting.

The electrical contractor will need the port number information to connect the luminaires correctly, this information will also be used to configure the lighting control system. For the system to work correctly the two must match, so well numbered drawings issued early are hugely beneficial to all concerned.



SPV type LCM with nine individually addressed ports, Hex address 021B, connected to nine luminaires in a rectangular pattern using left to right, top to bottom, port numbering convention.

Clearly indicate emergency luminaires, this information is required by the lighting control system to allow all emergency test features to be implemented. If an emergency luminaire is maintained then indicate whether it should be turned on and off with the control system or left permanently on.

CONTACT US

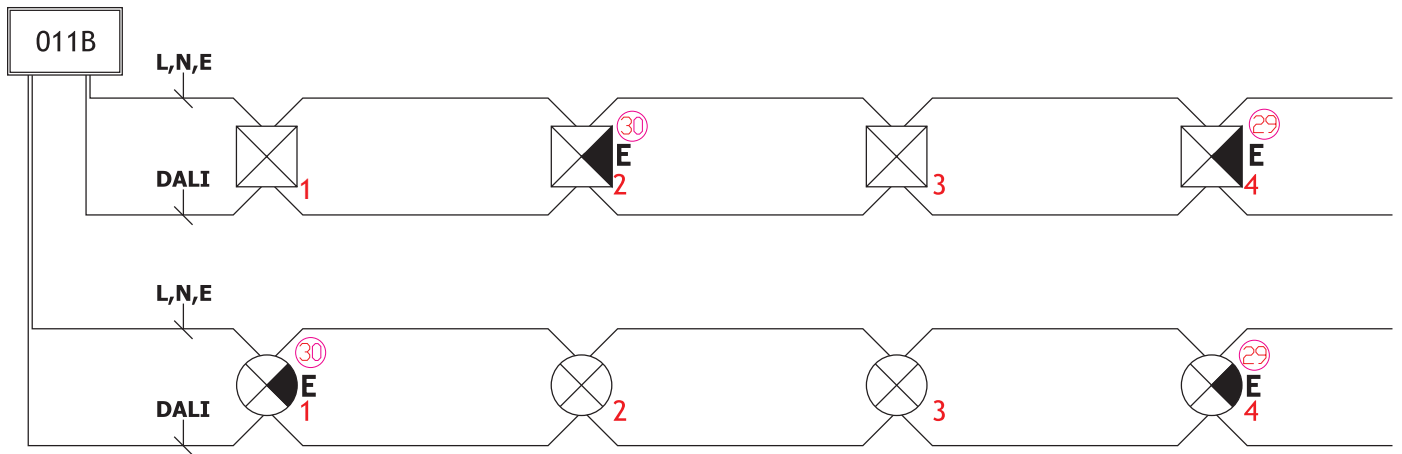
T | 01992 450126
E | SALES@SIMMTRONIC.COM
E | AFTERSALES@SIMMTRONIC.COM
W | WWW.SIMMTRONIC.COM

HQ | LONDON & SOUTH

WATERSIDE
CHARLTON MEAD LANE
HODDESDON, HERTFORDSHIRE
EN11 0QR

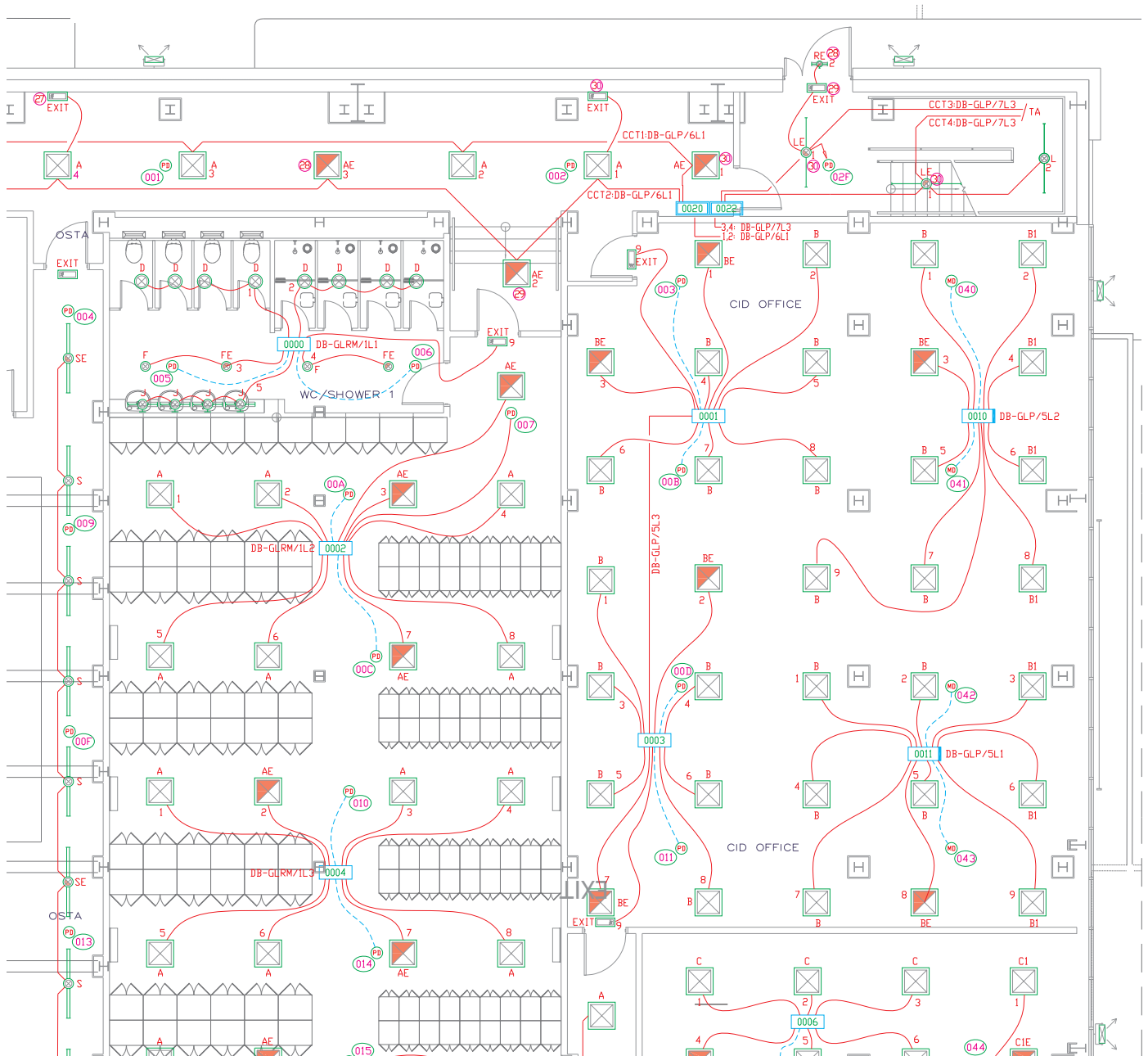
MIDLANDS & NORTH

BLOC
17 MARBLE STREET
MANCHESTER
M2 3AW



SPH type LCM provides 2 DALI buses to connect the luminaires to. The luminaires should be assigned sub address numbers in the range 1 to 20 (40 on some types). The Emergency Luminaires have an extra DALI inverter, these invertors also need to be assigned a sub address. To aid this it is Simmtronic practice to number these backwards starting at the highest address of 30.

An example of a correctly numbered section of a CAD drawing is shown below:

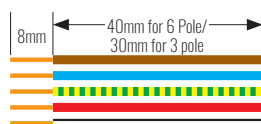


LCM LUMINAIRE PLUG WIRING

3 Pole	LEGACY*	3 Core Used for the Following LCabs: LCab1, LCab11 & LCab21
6 Pole	LEGACY*	3 Core Used for the Following LCabs: LCab7, LCab17 & LCab27 4 Core Used for the Following LCabs: LCab8, LCab18 & LCab28 5 Core Used for the Following LCabs: LCab9, LCab19 & LCab29 6 Core Used for the Following LCabs: LCab10, LCab20 & LCab30
4 Pole		3 Core Used for the Following LCabs: LCab2, LCab12 & LCab22 4 Core Used for the Following LCabs: LCab3, LCab13 & LCab23
5 Pole		3 Core Used for the Following LCabs: LCab4, LCab14 & LCab24 5 Core Used for the Following LCabs: LCab6, LCab16 & LCab26

*Connector system no longer compliant to latest connector standards. Please contact Simmtronic.

Cable Preparation Detail



For further details about LCab see the "LCab Cabling System" Data Sheet.

CONTACT US

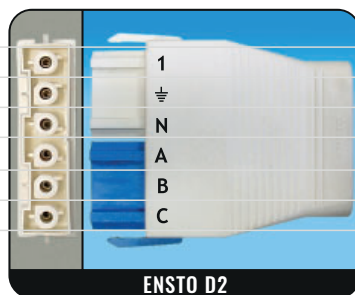
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PIN ARRANGEMENT

Switched Live
Earth
Neutral
Maintained Live
Control -ve/DSI/Da
Control +ve/DSI/Da



ENSTO D2



ENSTO ALP

	ENSTO D2	ENSTO ALP
Product	SPV.92, SPV.54, SPV.55, SPV.56, SPV.57	SPV.9, SPV.91, SPV.53 SimmBox
3 Pole Plug (switching only)	NAC31SH2.W	ALR 18.10/W NOW OBSOLETE (NB Right hand latch only)
3 Pole Plug (10th Port Only)	NAC31S.W	
6 Pole Plug (dimming &/or emergency)	NGCS6133	ALR18.1/W + AL18.1/S/L3 + ALV16/W NOW OBSOLETE

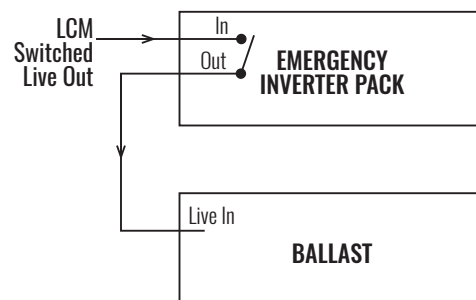
Pin Functions

Switched Live : This should be taken to the normal ballast Live Input*, normally this would be wired using a Brown core colour.

The LCM may have the facility to break this supply in order to turn luminaires off.

*Important Note for luminaires with integral emergency inverters

This connection must be taken to the normal ballast live input via a relay provided within the emergency inverter such that the inverter can ensure the normal ballast is de-energised prior to the change-over of emergency lamp terminals. This is essential to avoid inadvertent ballast shutdown and potential equipment damage. Suitable inverters are often referred to as "4 Pole Changeover Plus Delayed Ballast Energisation" or "5 Pole Inverter Pack" or "Full Isolation Inverter Pack".



Earth: This is a protective and functional Earth connection as required by the luminaire, accordingly it must be wired using a Green & Yellow core colour.

Neutral: This should be taken to the normal ballast Neutral Input and should be wired using a Blue core colour.

Maintained Live: This may also be referred to as Emergency, Un-switched Or Permanent Live. This is primarily intended for connection to battery powered emergency inverters integral to luminaires in order to charge batteries and monitor whether the local main supply is active; the LCM may break this supply in order to put the luminaire into emergency mode for testing. When specifically advised on drawings this may also be used to provide the Ballast Live supply.

Control -ve / DSI / Da & Control +ve / DSI / Da:

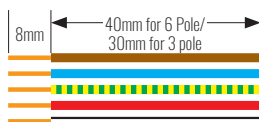
These terminals provide a control pair for dimming lighting where suitable gear exists. For 1-10V systems Control -ve should be taken to the -ve/com/OV gear input and Control +ve taken to the +ve/1-10V gear input. For DSI and DALI (Da) nearly always, these connections are polarity insensitive, meaning, they can be connected either way around. Check the equipment to be used. For polarity sensitive equipment, Control +ve generates a positive voltage signal with respect to Control -ve.

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Cable Preparation Detail



For further details about LCab see the "LCab Cabling System" Data Sheet.

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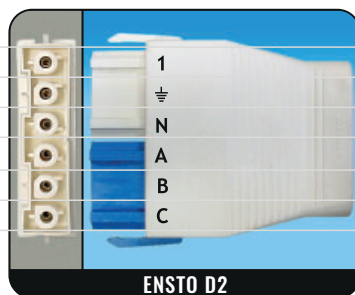
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PIN ARRANGEMENT

Switched Live
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Control -ve/DSI/Da
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ENSTO D2



ENSTO ALP

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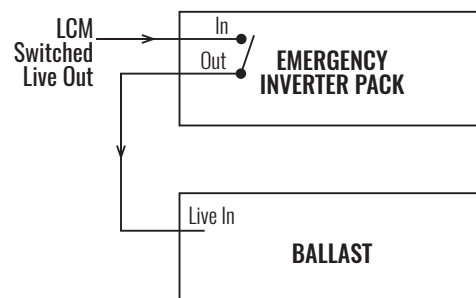
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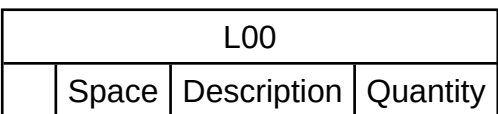
Building Research Establishment's Environmental Assessment Method (UK Technical Manual Version 3.0)

The following table lists categories within the *breeam* documentation where Simmtronic or its SPECS3 Lighting Control System can provide solutions against the *breeam* criteria, thus obtaining accreditation at a high level.

Category & Reference	Aims	Criteria	Solution
Management Man 04 Commissioning and handover	Encouraging a well-managed handover and commissioning process, which will ensure building services and fabric defects are identified and rectified.	Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing.	Simmtronic has a directly employed team of 30 commissioning engineers, managed by commissioning team leaders who take responsibility for the whole commissioning process for the lighting system. This ensures that where possible the same engineers are used throughout the commissioning process. These engineers provide detailed snag lists allowing the installer to rectify faults quickly.
Management Man 05 Aftercare	Encouraging aftercare support during the first year of the building operation, to ensure the building operates in accordance with the design intent and in response to the building occupants' needs.	Handover: A technical user guide for the premises facilities managers.	Simmtronic can provide an OEM manual that contains details of all equipment provided, along with detailed schematics and operational descriptions.
Management Man 05 Aftercare	Encouraging aftercare support during the first year of the building operation, to ensure the building operates in accordance with the design intent and in response to the building occupants' needs.	Handover: A technical training schedule for the premises facilities managers.	Simmtronic offers training courses both on site and at its own training suites, of different lengths and customised to customer requirements as required.
Health & Wellbeing Hea 01 Visual comfort	Glare control: Providing occupants with the conditions that facilitate good visual comfort by designing out the potential for glare.	Control of glare from sunlight:	Simmtronic provides, as part of the SPECS3 Lighting Control System, blind control modules. These modules can directly connect to 8 mains powered dual wound blind motors.
Health & Wellbeing Hea 01 Visual comfort	Glare control: Providing occupants with the conditions that facilitate good visual comfort by designing out the potential for glare.	Control of glare from sunlight: The use or location of shading does not conflict with the operation of lighting control systems	Simmtronic also provides internal photocells which act automatically to adjust artificial light levels in response to changing levels of natural light.
Health & Wellbeing Hea 01 Visual comfort	Internal and external lighting levels, zoning and control To ensure lighting has been designed in line with best practice for visual performance and comfort.	Internal lighting . . in all relevant areas of the building is designed to provide illuminance appropriate to the tasks undertaken, accounting for building user concentration and comfort levels.	The SPECS3 Lighting Control System allows the light output for an individual luminaire or group of luminaires to be adjusted to ensure areas are lit only to the required level. Tools are provided to accommodate changing output efficiencies of the luminaires as they age.
Health & Wellbeing Hea 01 Visual comfort	Internal and external lighting levels, zoning and control To ensure lighting has been designed in line with best practice for visual performance and comfort.	Zoning and occupant control Internal lighting is zoned to allow for occupant control.	The SPECS3 Lighting Control System allows luminaires to be assigned to control groups to suit the zoning strategy of each building region. A range of occupant controls is available including wall plates, wireless and infra-red controls and computer and phone apps.

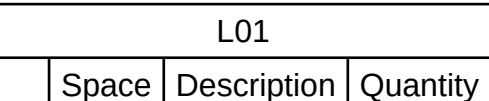
Category & Reference	Aims	Criteria	Solution
Health & Wellbeing Hea 01 Visual comfort	Internal and external lighting levels, zoning and control To ensure lighting has been designed in line with best practice for visual performance and comfort.	Zoning and occupant control To achieve an exemplary performance credit, lighting in each zone can be manually dimmed by occupants down to 20% of the maximum light output using dimmer switches positioned in accessible locations.	The SPECS3 Lighting Control System allows full dimming control of all luminaires. A range of occupant controls is available including wall plates, wireless and infra-red controls and computer and phone apps. All these occupant controls allow dimming from maximum down to zero light output.
Health & Wellbeing Hea 04 Thermal comfort	Thermal zoning and controls Giving occupants control over their environment through appropriate temperature control strategies and thermal zoning.	Thermal zoning . . . how the building services could efficiently and appropriately heat or cool zones within the building	Simmtronic can export real-time data from all presence detectors attached to the lighting system, using open protocols, allowing the HVAC system to adjust heating/cooling based on room/zone occupancy.
Health & Wellbeing Hea 04 Thermal comfort	Thermal zoning and controls Giving occupants control over their environment through appropriate temperature control strategies and thermal zoning.	Thermal controls An accessible building user actuated manual override for any automatic systems	Occupant controls offered by Simmtronic include smart graphical touch screens that can control blinds, lighting and heating. These screens interact with the HVAC system to show building users the current heat settings and to allow them to be adjusted/overridden.
Energy Ene 1 Reduction of energy use and carbon emissions	Reduction of energy use and carbon emissions Encouraging the design of energy efficient buildings with energy performance above national building regulations	Energy performance	With occupancy control, dimming of artificial light levels down to the required levels for visual comfort, daylight harvesting, time control and HVAC integration, Simmtronic plays a major role in reducing carbon emissions.
Energy Ene 2 Energy monitoring	Sub-metering of end-use categories Install energy metering systems so that at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories	If the area is greater than 1,000m ² , by end-use category: an appropriate energy monitoring and management system. If the area is less than 1,000m ² , separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system	The SPECS3 Lighting Control System includes energy monitoring tools that meet the Building Regulations Part L requirements for sub-metering of lighting power use. These tools do not require physical submeters to be installed on distribution boards and they provide outputs via IP open protocols to an energy monitoring and management system.
Energy Ene 2 Energy monitoring	Sub-metering of high energy load and tenancy areas To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of in-use energy consumption.	Monitor a significant majority of the energy supply for tenanted areas or relevant function areas or departments in single occupancy buildings.	The SPECS3 Lighting Control System energy monitoring tools can provide energy breakdowns for individual zones, whether divided by tenant or functional boundaries. These tools do not require physical submeters to be installed on distribution boards and they provide outputs via IP open protocols to an energy monitoring and management system.
Energy Ene 03 External lighting	External Lighting Reducing the building's energy consumption through the specification of energy efficient external lighting.	Automatic control to prevent operation during daylight hours	The SPECS3 Lighting Control System includes astronomical clock control of external lighting for automatic dawn/dusk control through the year
Energy Ene 03 External lighting	External Lighting Reducing the building's energy consumption through the specification of energy efficient external lighting.	Presence detection in areas of intermittent pedestrian traffic	SPECS3 presence sensors can be used to actuate on-demand lighting for these areas

Category & Reference	Aims	Criteria	Solution
Water Wat 04 Water efficient equipment	Identify systems or processes to reduce the relevant water demand and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.	Systems or processes to reduce the relevant water demand	SPECS3 lighting control modules can actuate water saving valves to shut off sanitary water when not needed. This can be occupancy or time based or both, using the same occupancy detectors that are used for energy-efficient control of the lighting.
Pollution Pol 04 Reduction of night time light pollution	Avoiding or reducing the impact of night time light pollution, through careful design and specification of light sources.	All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.	The SPECS3 Lighting Control System includes time program control for external lighting. Calendar control is also available to switch off all types of lighting on dates when a building is not in use and lighting is not required.



Rev	Date	Description	Int
00	23/10/23	P51421 MCFC Commercial Building - Lighting Layout	JEL
01	20/03/24	Mark-up to P01	JW
02	31/03/24	Mark-up to P01 Stage 4	JW

PRINCIPLE	DESIGNER	DRAWN					
CP	DA	SB					
PROJECT	ORIGIN	BLOCK	LEVEL	TYPE	WELL	NUMBER	PEN
NSE-SEE-CM-00-DR-E-630421							P01



Rev	Date	Description	Int
00	23/10/23	P01/021 MCFP Commercial Building - Lighting Layout	JE
01	20/01/24	Mark-up to P01	JW
02	31/01/24	Mark-up to P01 Stage 4	JW

Rev	Date	Description
00	23/10/23	PS1421 MCFC Commercial Building - Lighting Layout
01	20/01/24	Mark-up to P01
02	31/01/24	Mark-up to P01 Stage 4

NOTES

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT DESIGN DOCUMENTS, INCLUDING BUT NOT LIMITED TO: SPECIFICATIONS, SCHEDULES AND SPECIFICATIONS. THIS SHALL INCLUDE BUT NOT BE LIMITED TO: ELECTRICAL, MECHANICAL, PLUMBING, AND STRUCTURAL. THE DESIGNER SHALL BE RESPONSIBLE FOR THE DESIGN OF THE ELECTRICAL SYSTEMS.

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- LEGEND:
- ✓ LIGHT SWITCH (2) DIMMABLE (2) GANG
 - ✓ 2 WAY LIGHT SWITCH
 - ✓ DIMMABLE LIGHT SWITCH
 - ✓ INTERMEDIATE LIGHT SWITCH
 - ✓ KEY SWITCH
 - ✓ FULL CORD SWITCH
 - ✓ PASSIVE INFRARED DETECTOR
 - ✓ LIGHTING CONTROL MODULE
 - ✓ EMERGENCY EXIT SIGNAGE
 - ✓ 8 BUTTON SCENE PLATE
- SUGGESTION TO INTEGRATE DATA INTO TYPE R AND TYPE S2 FITTINGS - NO CHANGES MADE AS PER DES INSTRUCTION

REV	DATE	STAGE & ISSUE	DESCRIPTION
01	11/10/2024	ISSUE	FOR REVIEW

SES Engineering Services
2nd Floor, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 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698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 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