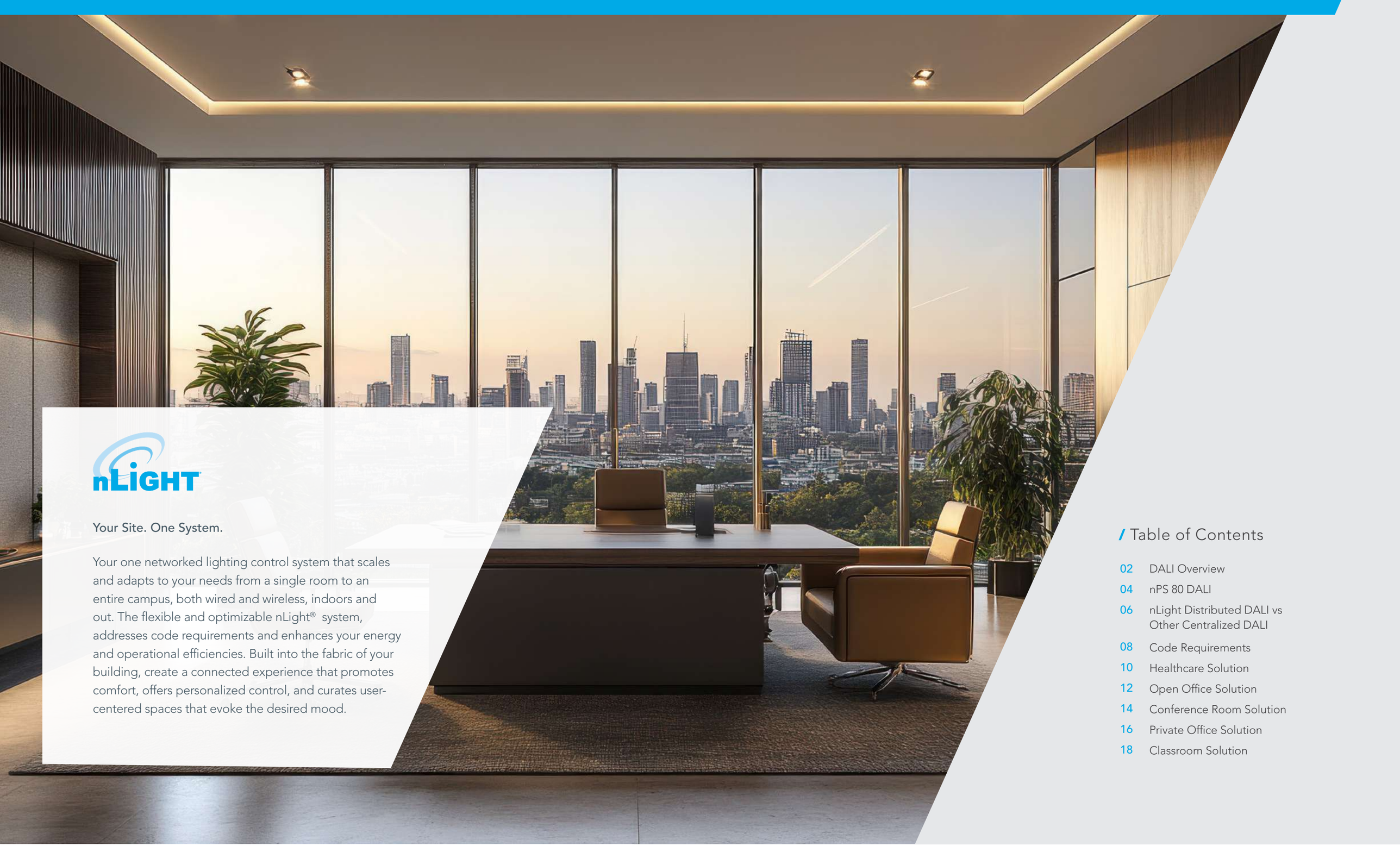
nLight®

DALI Application Guide

www.nlightcontrols.com



Your Site. One System.

Your one networked lighting control system that scales and adapts to your needs from a single room to an entire campus, both wired and wireless, indoors and out. The flexible and optimizable nLight® system, addresses code requirements and enhances your energy and operational efficiencies. Built into the fabric of your building, create a connected experience that promotes comfort, offers personalized control, and curates user-centered spaces that evoke the desired mood.

/ Table of Contents

DALI Overview

Overview

This guide provides an overview of the DALI® protocol, highlights the advantages of the nPS 80 DALI controller, and explains how its flexible configuration options make it suitable for a wide range of applications.

DALI

DALI (Digital Addressable Lighting Interface) is an internationally recognized, two-way communication protocol that enables digital control and feedback between the components of a lighting system. Originally developed in the 1980s, DALI continues to serve as a global standard for interoperable lighting control.

Common Components:

DALI Gateways

Panel-based cabinets, which are typically located in an electrical room, communicate with the network software and the DALI network, linking luminaires, sensors, and switches.

DALI Drivers

The luminaires in a DALI system must have a DALI-capable driver. For example, eldoLED® offers a range of DALI drivers. DT8-enabled drivers add tunable-white capability by allowing a single DALI address to control both intensity and color temperature.

DALI Input Devices

In a DALI-2 system, sensors and switches send input to the controller, which then issues the lighting commands. Input devices do not communicate directly with the drivers..

DALI Wiring

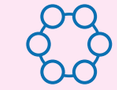
DALI will work with bus, star (hub and spoke), tree, or line topologies.
See the illustrations for more details.

Network Software

Network software is used on a computer or server to commission the system, perform programming, and support diagnostics and ongoing maintenance.

DALI WIRING TOPOLOGIES

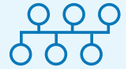
Not Acceptable



Ring wiring

Mesh wiring

Acceptable



Bus wiring

Star wiring
(Hub & spoke)

Tree wiring

Line wiring

nPS 80 DALI

nLight® Controller with DALI Protocol

Overview:

The nLight nPS 80 DALI controller is certified for DALI-2, enabling seamless integration between nLight and DALI networks. It supports a wide range of applications including static white lighting, tunable white solutions, emergency lighting, and both line-voltage and low-voltage installations through flexible configuration options.

Advantages of DALI and nLight:

Flexible and Scalable

- With the nPS 80 DALI, each driver can be assigned to as many as 16 zones using software-based configuration, eliminating the traditional need for multiple control wires to each luminaire. This zoning flexibility makes it easy to adjust settings without physically modifying the wiring.
- The nPS 80 DALI 8Z CCT with DT8 mode LED drivers offers precise control over both light intensity and color tuning, helping match color temperature across luminaires so different fixtures can operate cohesively.
- The nPS 80 DALI power pack can be placed in an electrical room when used in a centralized design. For example, when paired with a relay panel in distributed systems, it can be installed in or near the spaces being controlled

Simplified System Commissioning

In centralized systems, commissioning a DALI network often requires two technicians, one at the field location and another at the control room searching for devices. With the nPS 80 DALI installed locally, identification and setup become much easier. The device can detect new drivers automatically and handle addressing and programming without manual intervention.

Operational Savings

- Using one nPS 80 DALI to manage all fixtures in a room removes the need for multiple control devices, reducing hardware requirements and simplifying system design. This creates a cost-effective distributed architecture.
- Placing the nPS 80 DALI in or near the illuminated space eliminates the need for DALI gateways in a central room. This allows the DALI system to “stand alone” within a single room, reducing wiring complexity and optimizing space.

Emergency Lighting

Certain models support UL 924 emergency operation. When the device detects a loss of normal power within a lighting zone, it automatically switches to emergency mode and pushes connected luminaires to full brightness as required by UL 924.

nPS 80 DALI

nPS 80 DALI ER

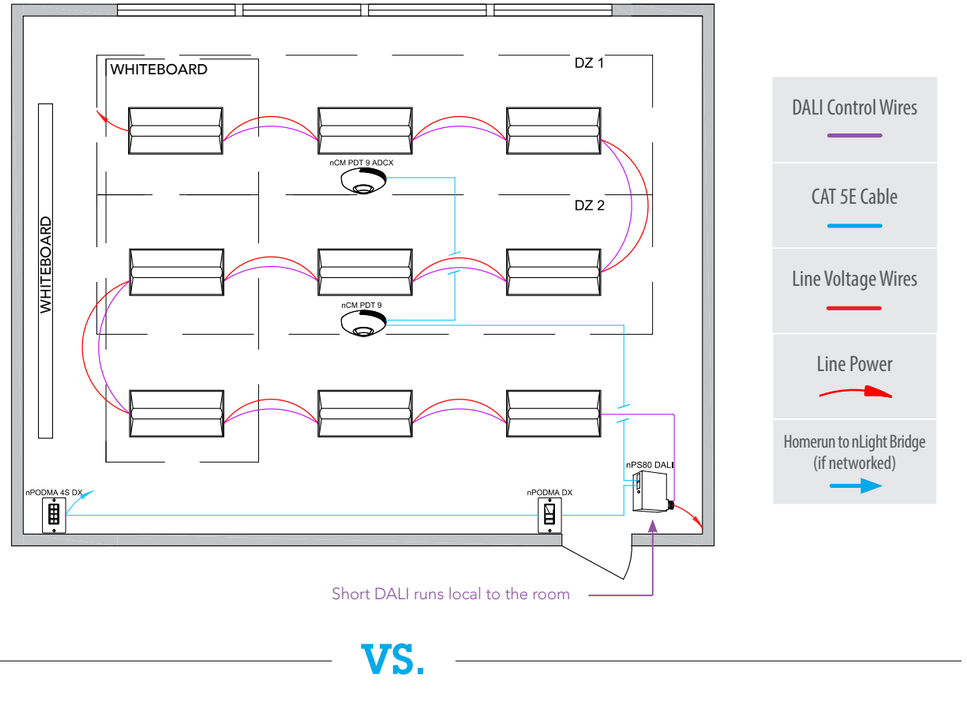
nLight Distributed DALI vs Other Centralized DALI

A Familiar Distributed Approach, Enhanced for Digital Control

The nPS 80 DALI applies the same distributed concept as 0-10V power packs to digital lighting, eliminating the need for centralized DALI gateway cabinets and long homeruns back to an electrical room.

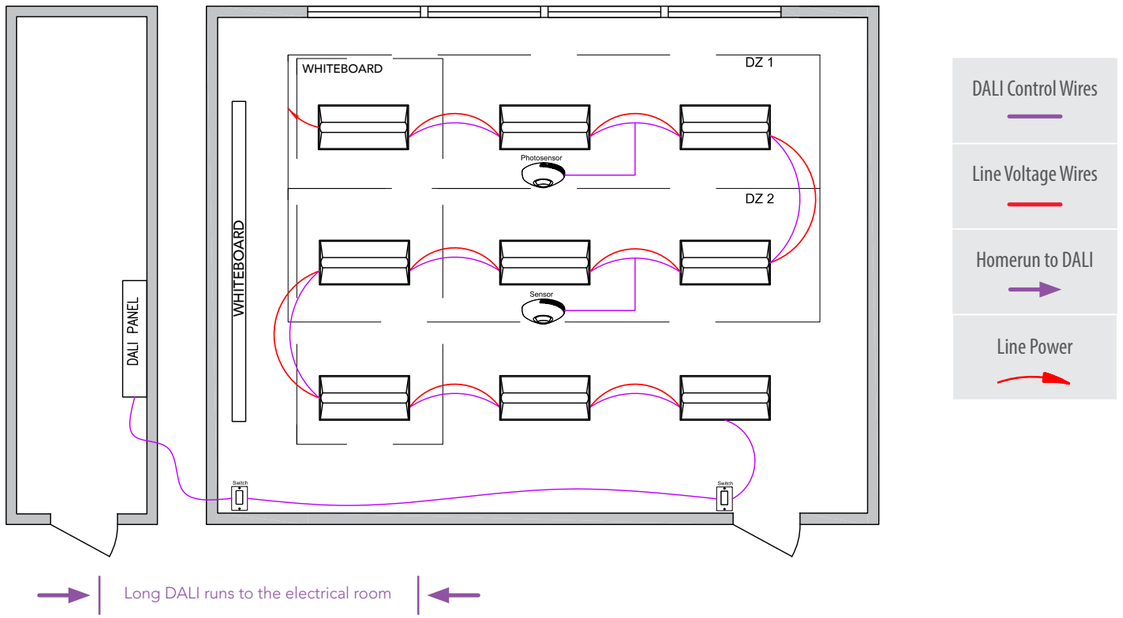
By managing DALI drivers locally, the system avoids wiring-distance limitations, reduces voltage drop concerns typical with analog 0–10V installations, and improves overall commissioning accuracy. This architecture keeps room-level control simple and intuitive, while still providing the advanced capabilities and interoperability of DALI-2.

nLight Distributed DALI

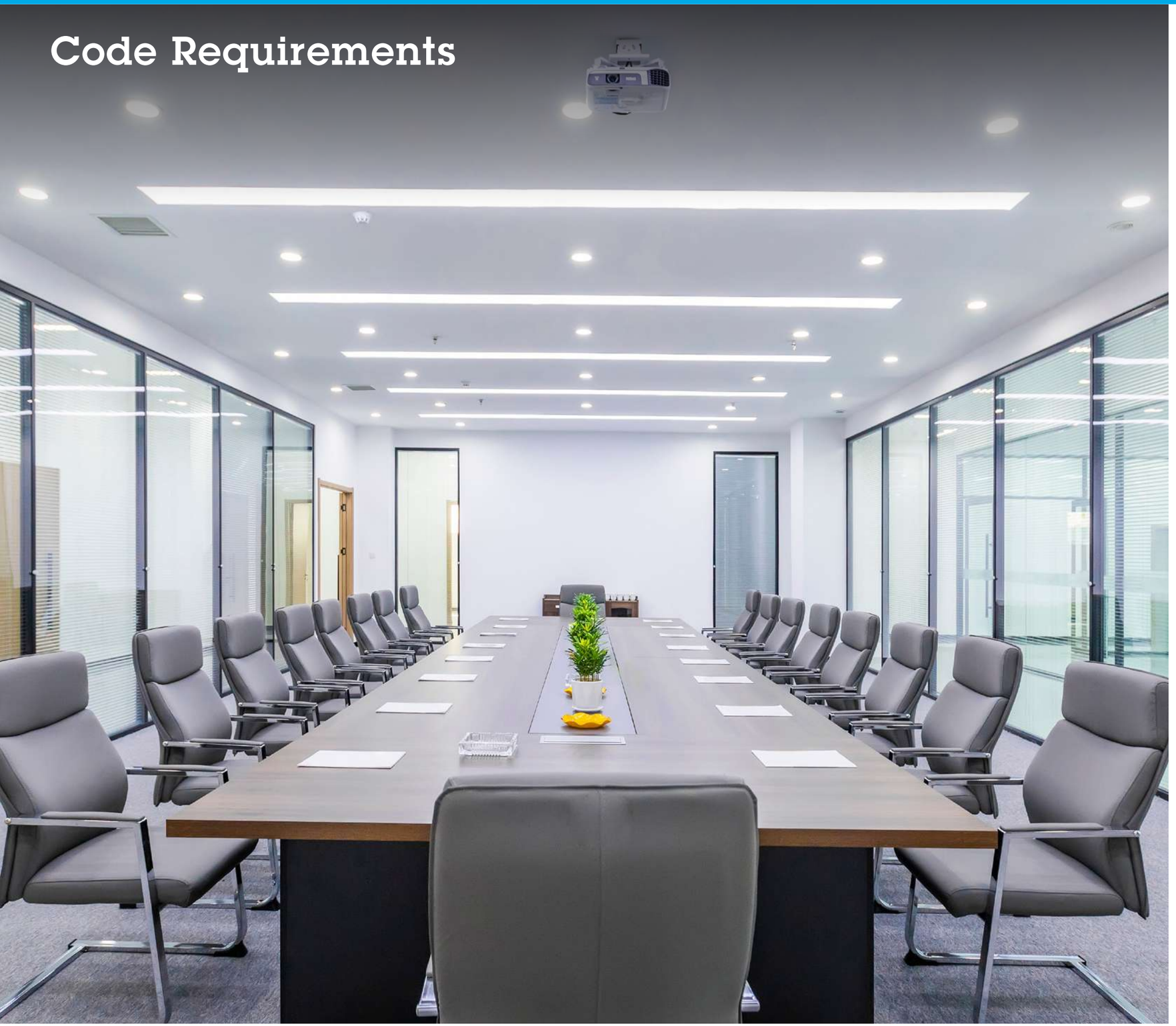


VS.

Other Centralized DALI



Code Requirements



Code Requirements

The nPS 80 DALI controller aids in compliance with the following:

Code Compliance

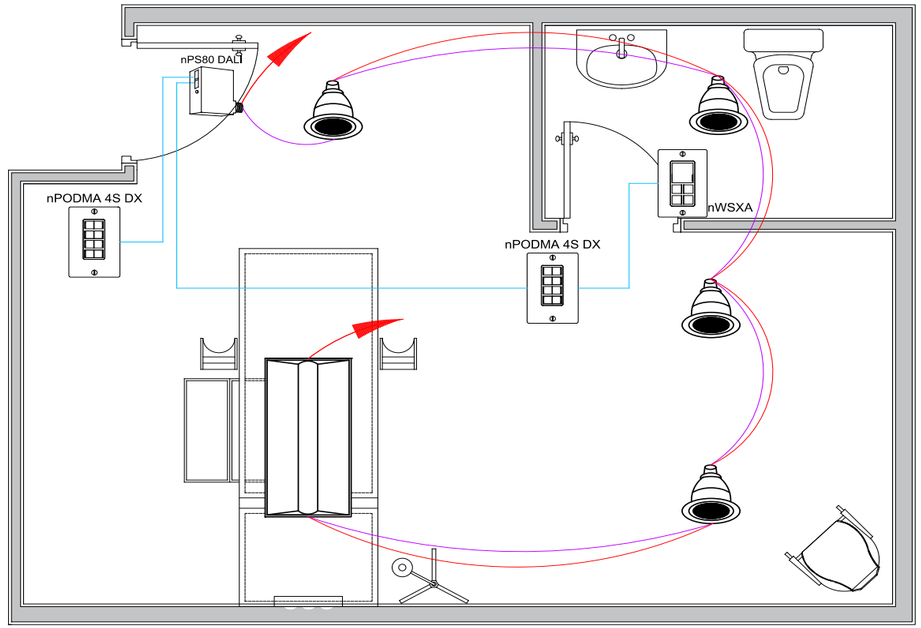
Compliant with Title 24, ASHRAE 90.1, IECC, and NECB energy code requirements.

Renovations and Addressing Code

The nPS 80 DALI allows the DALI LAN to run in conduit with the luminaire power (Class 1) or low voltage outside the conduit (class 2). Class 2 applications are typical of renovation projects where there are no dimming wires.

Contact your local lighting agent *for more information on luminaires with networked embedded controls by nLight. nLight wired or wireless networked control devices address the requirements of Luminaire Level Lighting Controls (LLLC), as specified in the IECC 2024 code.*

Patient Room



DALI Control Wires

CAT 5E Cable

Line Voltage Wires

Line Power

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	1	See Description	Troffer with DALI DT8 Driver
	4	See Description	Downlights with DALI DT8 Driver
	1	nWSXA PDT DX	On/Off & Raise/Lower Wall Sensor Switch

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	2	nPODMA 4S DX	4-Scene Wall Switch with Raise/Lower
	1	nPS 80 DALI 8Z CCT	DALI Power Pack with Tuneable White

/ OPERATION DETAILS:

Light Fixtures:

- All fixtures are equipped with DALI DT8 compatible drivers for tunable white functionality.

Manual Control:

- The nPODMA 4S DX provides manual control of the space with up to four selectable scenes, along with full raise/lower dimming capabilities.

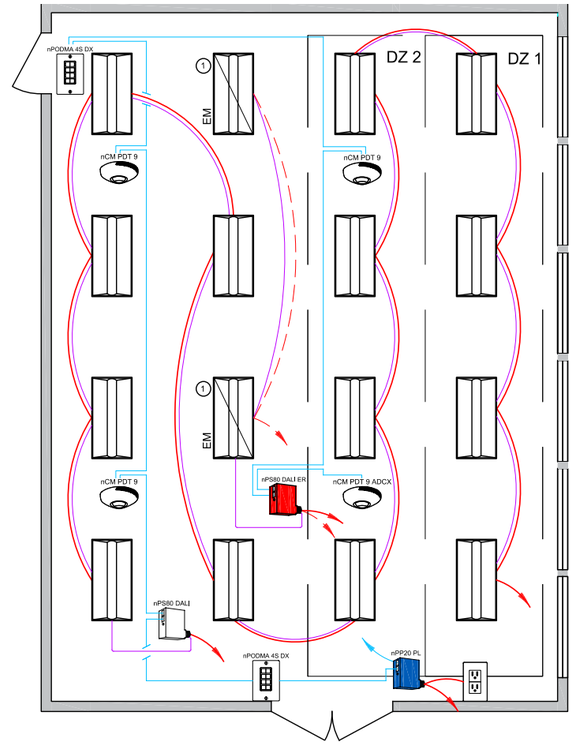
Automatic Control

- Automatic on/off controls are provided in the restroom via the nWSXA.

/ ADDITIONAL OPTIONS:

- Tunable white is commonly used in healthcare applications. Luminaires can be requested to change from 0-10V or nTune™ to DALI DT8.
- Reliability and long lifespan are essential in healthcare environments where luminaire maintenance can disrupt patient rooms and corridors. nLight controls offers DC2DC (low-voltage DC powered) options that provide longer life compared to traditional 120V or 347V systems. When equipped with DALI-capable drivers, DC2DC luminaires can also participate fully in DALI control strategies, enabling tunable white, occupancy response, and daylight harvesting within the same low-voltage infrastructure.
- Ability for luminaires to return to the last state after a power failure.

Open Office



DALI Control Wires

CAT 5E Cable

Line Voltage Wires

LINE VOLTAGE WIRES (Emergency)

Homerun to nLight Bridge (if networked)

LINE POWER(Normal)

LINE POWER(Emergency)

{i} Luminaire on Emergency Generator Backup System

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	16	See Description	Troffer with DALI Driver
	2	nPODMA 4S DX	4-Scene Wall Switch with Raise/Lower
	1	nPP20 PL	Plug Load Controller

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	1	nPS 80 DALI ER	DALI Power Pack Emergency
	1	nCM PDT 9 ADCX	Occupancy Sensor and Photosensor
	3	nCM PDT 9	Occupancy Sensor

/ OPERATION DETAILS:

Light Fixtures:

- All fixtures are equipped with DALI drivers.
- All fixtures can be individually addressed or controlled together.

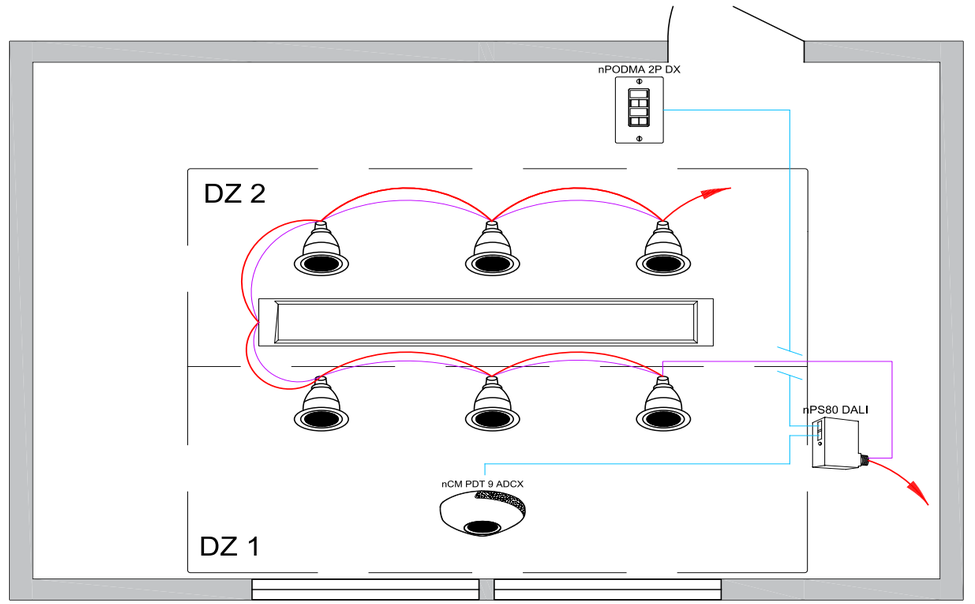
Manual Control:

- The nPODMA 4S DX provides manual control of the space with up to four selectable scenes, along with full raise/lower dimming capabilities.

Automatic Control

- The nCM PDT 9 occupancy sensor turns lights on to preset intensity levels—per local energy code or specification—when motion is detected, and also activates the controlled plug load. When the space becomes vacant, the lights turn off after the programmed grace period, and the plug load is de-energized.
- The nCM ADCX DZ photocell, mounted adjacent to the window, provides continuous daylight harvesting for both primary and secondary daylight zones.
- Many conference rooms use movable partitions. Native nLight controls support a single partition, and for larger rooms that require multiple partition combinations, Fresco controls expand those capabilities while still working seamlessly with the nPS 80 DALI.

Conference Room



DALI Control Wires

CAT 5E Cable

Line Voltage Wires

Line Power

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	1	See Description	Linear Fixture with DALI Driver
	6	See Description	Downlights with DALI Driver
	1	nPODMA 2P DX	2-Pole Dimming Switch

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	1	nPS 80 DALI	DALI Power Pack
	1	nCM PDT 9 ADCX	Occupancy Sensor and Photosensor

/ OPERATION DETAILS:

Light Fixtures:

- All fixtures are equipped with DALI drivers.
- All fixtures can be individually addressed or controlled together.

Manual Control:

- Two-pole dimmer for independent manual control (ON/OFF/DIM) of downlights and linear fixtures.

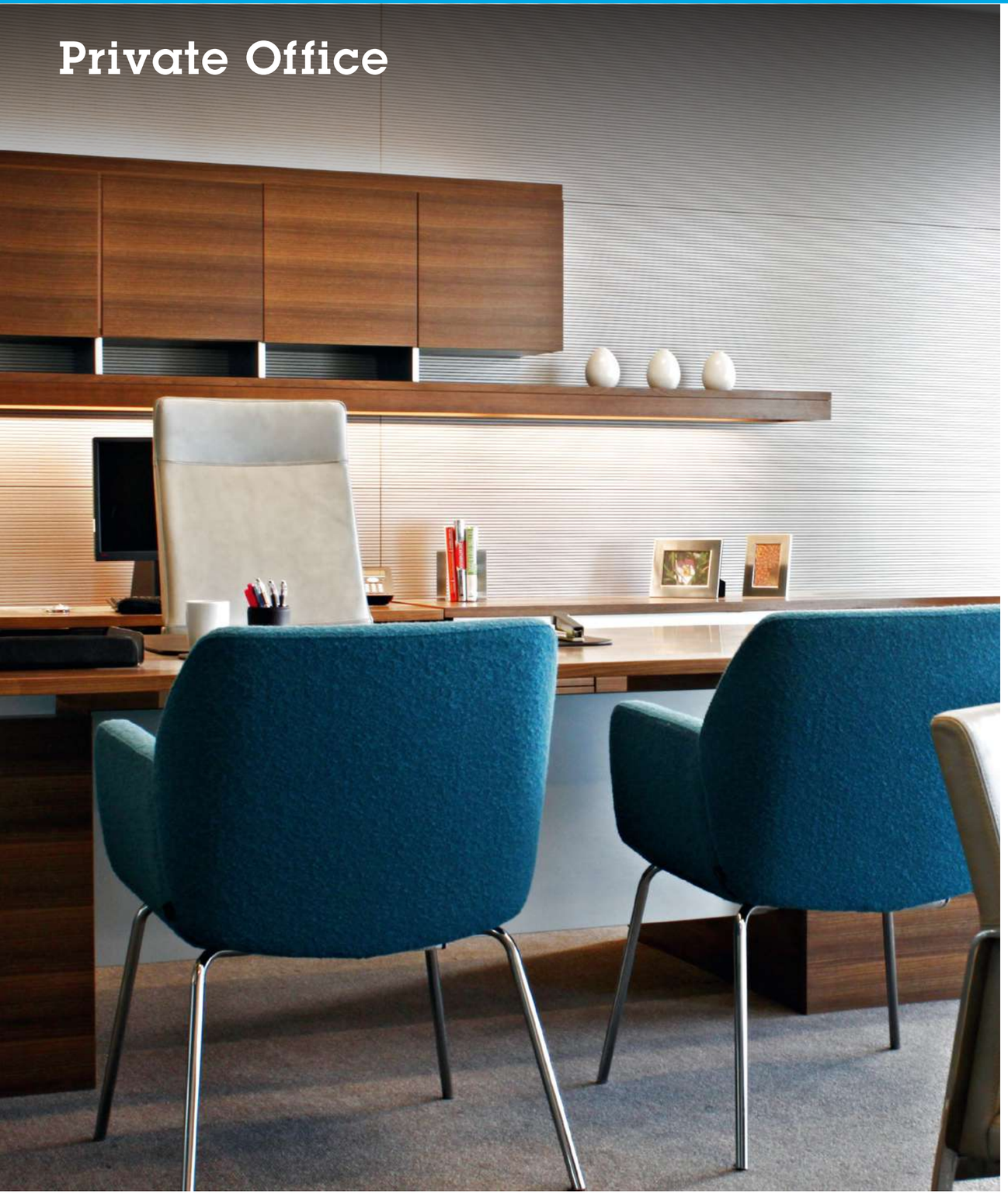
Automatic Control

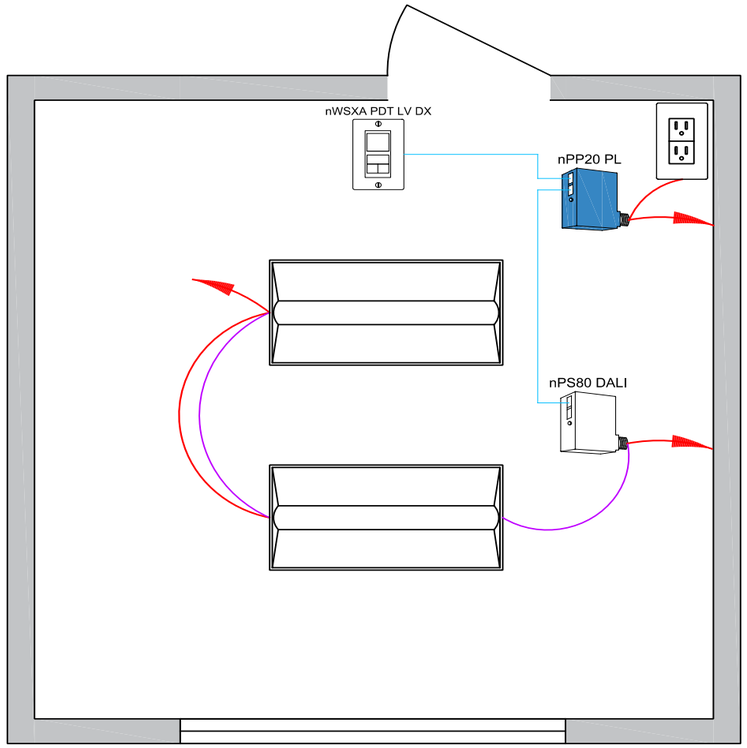
- Occupancy and photo sensor detection.

/ ADDITIONAL OPTIONS:

- DALI, 0-10V, and phase-dimming loads often coexist in the same room, especially in renovation or mixed-luminaire applications. nLight controls support all three methods—either independently or simultaneously—using dedicated DALI controllers and power-pack dimming options, allowing designers to standardize on one control system regardless of the dimming type required.
- Many conference rooms use movable partitions. Native nLight controls support a single partition, and for larger rooms that require multiple partition combinations, Fresco controls expand those capabilities while still working seamlessly with the nPS 80 DALI.

Private Office





DALI Control Wires

CAT 5E Cable

Line Voltage Wires

Line Power

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	2	See Description	Troffer with DALI Driver
	1	nWSXA PDT LV DX	Wall Sensor and Dimming Switch

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	1	nPS 80 DALI	DALI Power Pack
	1	nPP20 PL	Plug Load Controller

/ OPERATION DETAILS:

Light Fixtures:

- All fixtures are equipped with DALI drivers.
- All fixtures can be individually addressed or controlled together.

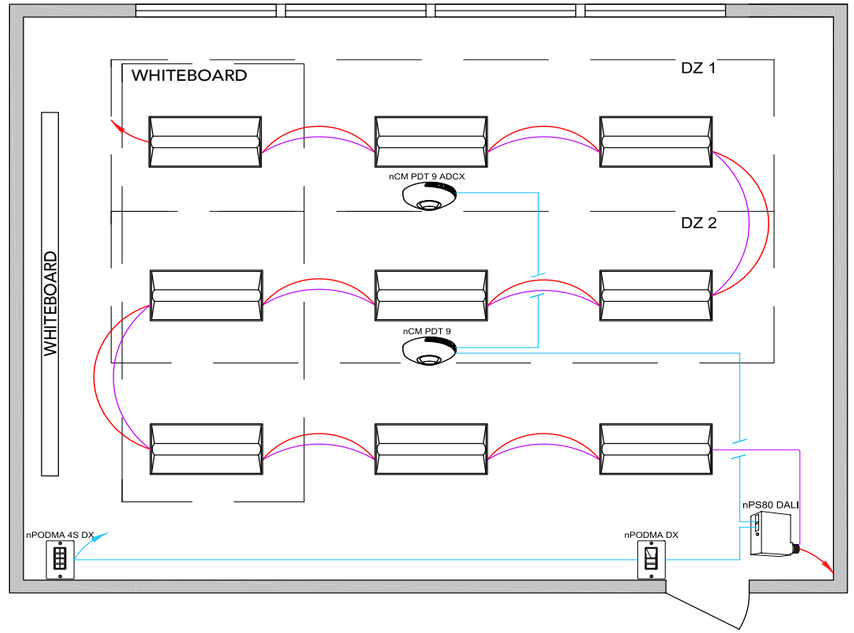
Manual Control:

- ON/OFF/DIM control of lights provided at entry.

Automatic Control

- The nWSXA wall sensor switch turns lights on to the designated intensity level—per local energy code or specification—when motion is detected, and also activates the controlled plug load. When the space becomes vacant, the lights turn off after the programmed grace period and the plug load is deactivated.

Classroom



DALI Control Wires

CAT 5ECable

Line Voltage Wires

Line Power

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	9	See Description	Troffer with DALI Driver
	1	nPODMA 4S DX	4-Scene Wall Switch with Raise/Lower
	1	nPODMA DX	On/Off/Dim Switch

BILL OF MATERIALS

Symbol	Qty	Product #	Description
	1	nPS 80 DALI	DALI Power Pack
	1	nCM PDT 9 ADCX	Occupancy and Photo Sensor
	1	nCM PDT 9	Occupancy Sensor

OPERATION DETAILS:

Light Fixtures:

- All fixtures are equipped with DALI drivers.
- All fixtures can be individually addressed or controlled together.

Manual Control:

- Up to four scenes can be selected using the nPODMA 4S, allowing manual control of the patient bed luminaire and the three adjacent downlights in the space.
- At the room entry, the nPODMA DX single-pole manual dimmer provides ON/OFF/DIM control for all luminaires.

Automatic Control

- The nCM PDT 9 occupancy sensor turns lights on to code-defined or spec-defined intensity levels when motion is detected. After the programmed grace period following vacancy, the lights turn off automatically.
- The nCM ADCX DZ photocell, mounted adjacent to the window, provides continuous daylight harvesting for the primary and secondary daylight zones.

Contact Information:
1-800-705-7378

1 Acuity Way, Decatur GA 30035 | 1-800-705-SERV (7378) | www.acuitybrands.com