

DALI Line Controllers

The BM-DALI Line Controllers are required to link the distributed DALI Lines onto an Ethernet network to provide a building-wide DALI system. The Line Controllers provide configuration, monitoring, control, reporting and maintenance functions.

The Line Controllers are to operate independently and must continue to process local inputs and schedules when disconnected from the Ethernet network. The controllers must not be reliant on a server or other control system in order to operate.

The Line Controllers are to provide scheduling of DALI groups for scheduled occupancy, sequencing for override timers and effect lighting.

The Line Controllers shall provide local intelligence and features including:

1. Integrated real time clock with automatic daylight savings adjustment and leap-year correction.
2. Integrated sunrise/sunset support based on site location (latitude and longitude).
3. Automatic Time Schedules to control groups for scheduled occupancy with support for holiday exceptions.
4. 16 multi-function digital inputs for pushbuttons and sensors including occupancy sensors and daylight sensors and for integration with access control and security panels.
5. 2 digital outputs for additional control and interlocking to external equipment such as fans and blinds.
6. Up to 32 configurable sequences for override sequences, mood and effect lighting.
7. Up to 32 configurable command lists for advanced control and effects.
8. Support for two DALI Lines (up to DALI 128 ballasts).
9. Zone control whereby groups on different DALI Lines are controlled together as one entity.
10. An in-built web server for status and error reporting of DALI Line, ballast and lamp failures. The status shall include lamp hours.
11. DALI Emergency testing and reports.
12. Local processing. In the event of network failure or disconnection from the Ethernet network the Line Controller is to continue to run automatic time schedules and sequences and process inputs independently.
13. Computer monitoring and configuration. The Line Controller shall allow configuration, monitoring and analysis from computers on the Ethernet network.
14. Computer control. The Line Controller shall allow occupants to control their local lighting using their computers on the network.

The BM-DALI Line Controllers are to be located in the switchboard with their associated DALI line power supplies.

Line Controller Inputs and Input Profiles

The Line Controller inputs are required to provide manual control through the use of switches and pushbuttons, occupancy control using motion detectors and daylight harvesting using light sensors. The inputs are also used for integration with remote controls, security panels and access control systems.

The Line Controller shall provide:

1. 16 integral digital inputs for use with switches, pushbuttons, occupancy sensors, light sensors etc.
2. Multi-group functionality so that one input can control multiple DALI Groups. An input is not to be limited to a single group.
3. Dynamic Input Profiles that enable an input to operate differently for Normal-hours and After-hours operation.

Examples of uses for this functionality include but are not limited to:

Wall-plate Pushbutton

Office Hours:	Single button dimmer
After Hours:	Toggle MAXIMUM/OFF with dimming override sequence (30 min 75%, 5 min 50%, 5 min 25%, 5 min OFF)

Wall-plate Pushbutton – After Hour cleaners

Office Hours:	Single button dimmer
After Hours:	Toggle 60%/OFF with override sequence (25 min MINIMUM, 5 min OFF)

After hours Occupancy sensor

Office Hours:	disabled (lights are scheduled ON)
After Hours:	30 minute Override Sequence (MAXIMUM, 20 min 50%, 5 min 25%, 5 min OFF)

Occupancy sensor with variable override

Office Hours:	60 minute Override Sequence
After Hours:	30 minute Override Sequence

Toilet occupancy – reed switch

(Toilet lights are scheduled on to MINIMUM)	
Office Hours:	MAXIMUM, 15 min MINIMUM
After Hours:	30 minute Override Sequence

- a) The inputs are to provide different functionality based on a condition.

For example, in a partitioned room a wall-plate switch is to control the partitioned area when the partition is closed and the whole area when the partition is opened.

Automatic Time Schedules

In order to cater for scheduled occupancy of the building the Line Controllers shall include an integrated real-time clock and automatic schedule control.

The Line Controller shall provide:

1. An integrated real-time clock to allow automatic time schedules to be run independent of the Ethernet network.
2. The real-time clock is to provide automatic daylight savings adjustment and leap year correction.
3. Sunrise/sunset support based on site location. Schedules are to be provided with a configurable offset to allow lighting to be controlled relative to dusk and dawn. Eg: Sunrise + 20 minutes.
Sunset – 30 minutes
4. Active Periods where a timer can be configured to fire only within a defined date range. Eg. From June 1 to Aug 31.
5. Custom time schedules are to be configured for an absolute time. Eg. Office Open, Monday to Friday at 8:30am
Cleaners lights, Thursdays at 8:00pm
6. Repeat timers. Eg: Run façade lighting sequence every 30 minutes from 7pm until 11pm
7. Time schedules must be able to be configured to include or exclude holiday periods. Holiday periods are to be configurable for one or more days and are to be able to be selected as perpetual (eg. January 1, every year)
8. Scheduled actions are to include all DALI arc levels (eg. 80%), DALI indirect commands (eg. GOTO MAXIMUM, RECALL SCENE2), Sequences (eg. 50%, 5 mins 25%, .5 mins OFF) and Command Lists.
9. Configuration of the time schedules is to be completed from a computer over the Ethernet network.

Sequences

Control sequences are required to provide multi-step override timers and mood and effect lighting.

Examples of uses for sequences include:

Override sequence 30 mins 75%, 5 mins 50%, 5 mins 25%, 5 mins OFF

Delayed exit button Goto 50%, 5 mins MINIMUM, 5 mins OFF

Façade color mixing variations in red, green, blue over time

Mood lighting SCENE1, 20 sec SCENE2, 30 sec SCENE3, 40 sec SCENE4

1. The Line Controllers are to be able to store 32 sequences of up to 8 steps where each step consists of a configurable time delay and action. Longer sequences are to be achieved by linking sequences.
2. Sequences are to be activated by a Time Schedule, from an Input or by Computer/PDA/Touch Screen via the Ethernet network.
3. Configuration of the sequences is to be completed from a computer over the Ethernet network.

Command Lists

Command Lists are required to provide a series of actions to different groups in response to a timer or input. An example of a command list is may be to provide a structured shutdown of all lighting when the building is secured.

- a) The Line Controllers are to be able to store 32 Command Lists of up to 8 steps where each step consists of a target ballast, group or zone, a configurable time delay and an action. Longer command lists are to be achieved by linking command lists.
- b) Command Lists are to be activated by a Time Schedule, from an Input or by Computer/PDA/Touch Screen via the Ethernet network.
- c) Configuration of the Command Lists is to be completed from a computer over the Ethernet network.

Computer Control

In order to get the most out of the lighting control system it is advantageous to provide individual occupants with the ability to adjust the light level of their own workspace. This is particularly true of people working in front of a computer screen where comfort levels differ from person to person.

It is therefore a requirement of the Line Controller to accept commands from computers connected to the Ethernet network. This provision is to be provided by a desktop applet that provides the user with full control of their lighting.

The applet is to include a slider with full dimming capabilities plus buttons with the following functions: Maximum, Minimum, Off, Scene 1 to 16, Previous, Favorite 1 to 4.

The group of ballasts to be controlled is to be configurable.

Status and Error Information

The Line Controllers are to monitor the connected DALI Lines are to provide status and error information for DALI Lines, ballasts and lamps.

The status and error information is to be available on web pages served by the integrated webserver in the Line Controller. This means that only a web-browser is required by maintenance or operations staff to monitor the system.

The Line Controller is to monitor and track lamp hours for connected luminaires and emergency fittings. If the DALI ballast does not support lamp hours then the Line Controller is to provide the tracking.

Maintenance and Ballast Replacement

The Line Controller is to monitor the connected DALI Lines are to provide status and error information for DALI Lines, ballasts and lamps. The maintenance software is to identify a faulty ballast and address and reconfigure the replacement ballast with a simple point and click operation.

All group, scene and configuration settings are to be restored to the DALI ballast.