



**ELH CORRIDOR AND OPEN AREA LED DALI/SELF-TEST
EMERGENCY LIGHTING MANUAL**

ELH C LED SC SM - EN10080005

ELH C LED SC FM - EN10080012

ELH O LED SC FM - EN10080029

ELH O LED SC SM - EN10080036





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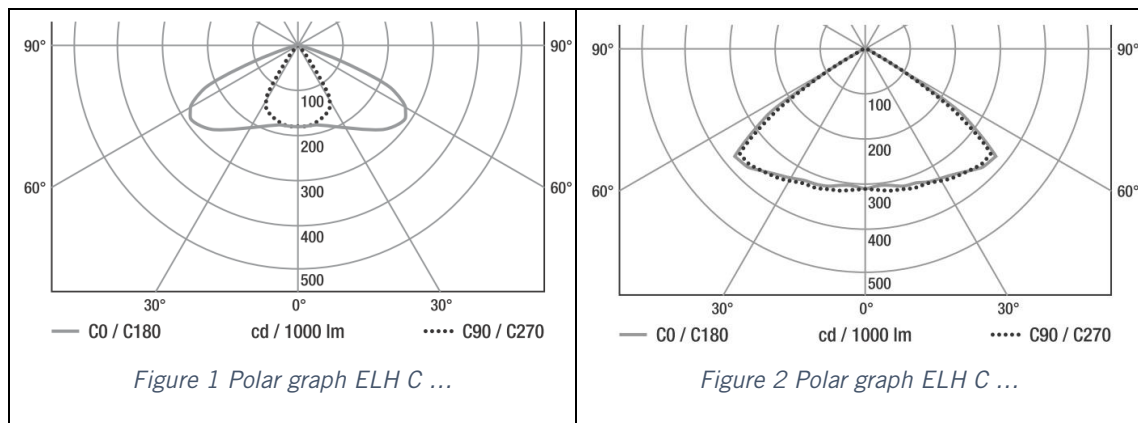
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1 DESCRIPTION

The single-battery emergency light illuminate the escape route in the event of failure of the general power supply.

This light contains built-in LED lamps. The lamps cannot be changed in the luminaire.



The ELH DALI (Digital Addressable Lighting Interface)/Self-test Emergency Lighting modules are designed to be compatible with the DALI Standard IEC 62386-202¹ as well as the Control Gear Standards IEC 61347-2-7², IEC 61347-2-13³ and IEC 62384⁴ and Automatic Test System Standard IEC 62034.⁵

The modules are DALI device type 1, and are suitable for use on a dedicated DALI emergency lighting system or in conjunction with other DALI compatible devices as part of a DALI general lighting system.

The module will adopt a self-test (automatic test) mode if it is not connected to a DALI bus, or the DALI communication is missing.

¹ IEC 62386-202:2009 Digital addressable lighting interface – Particular requirements for self contained emergency lighting

² IEC 61347-2-7:2006 Particular requirements for d.c. supplied electronic ballasts for emergency lighting

³ IEC 61347-2-13:2006 Particular requirements for d.c or a.c supplied electronic control gear for LED modules

⁴ IEC 62384:2006+A1:2009 DC or AC supplied electronic control gear for LED modules – Performance requirements

⁵ IEC 62034:2006 Automatic test systems for battery powered emergency escape lighting



NOTE All ELH DALI emergency modules are non-dimmable i.e. no arc power commands are supported.

2 SAFETY INSTRUCTIONS



WARNING! Work on electrical systems must be carried out by authorised personnel only, with due regard to the applicable installation regulations. Switch off the power supply before installing the system.



NOTE: this device must not be disposed of as unsorted household waste. Used devices must be disposed of correctly. Contact your local town council for more information.



NOTE: used batteries must not be disposed of as unsorted household waste. Used batteries must be recycled and may be returned free-of-charge to the place of sale. Batteries contain substances which are harmful to the environment and to human health and must therefore be disposed of correctly.

3 INSTALLATION AND COMMISSIONING

The light should only be installed on a stable, flat surface. Follow the design guide. Before installation, connect the battery to the emergency light.

Connect the emergency light according to the circuit diagram:

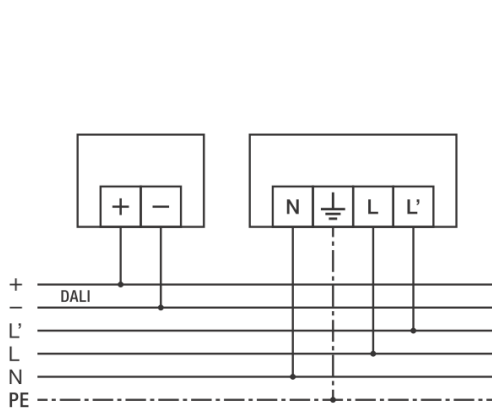


Figure 3 ELH ... SM

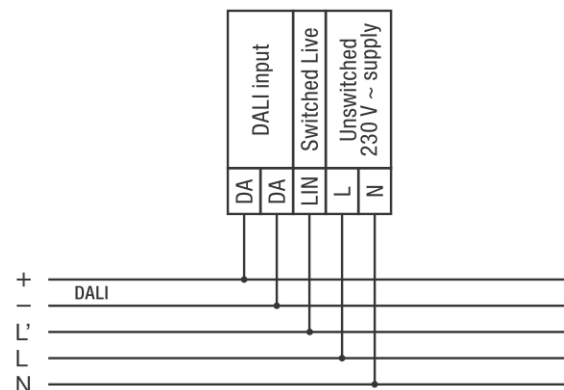


Figure 4 ELH ... FM

An automatic self-commissioning check will be done once a permanent mains supply and the battery have been connected to the module. This will ensure that the system, the emergency lamp and battery are performing correctly. Whilst this check is in progress the local LED indicator will slowly flash green and it is still possible for the module to be put into a function test to check emergency operation, either by a DALI command or by interrupting the mains supply.

As part of the self-commissioning check, a full duration test is performed once the battery has been charged for 20 hours. If this initial charge period is interrupted, the charge level is reset to zero and the 20 hour charge period recommences. The self-commissioning check ends after successful completion of the duration test. The local LED indicator then changes to a steady green once the check is complete.

NOTE: If a self-commissioning check that is in progress is cancelled due to a module receiving a DALI 229 'STOP TEST' command. It is then the responsibility of the system commissioning engineer to ensure that the modules self-commissioning check is completed.

Automatic self-commissioning is repeated whenever all power is removed from the module and then restored, equally if the battery is fully discharged after an interruption to the mains supply.



4 OPERATING MODES

The ELP DALI modules adapt their operating mode depending on whether a DALI bus/signal is connected.

4.1 SELF-TEST MODE

The module will adopt a self-test (automatic test) mode if it is not connected to a DALI bus, or the DALI communication is missing. Whilst in self-test mode the module will continue to monitor for a DALI signal and if one is detected the module will go into DALI mode. On completion of the self commissioning check (see section 3) the self-test program starts with the first function and duration tests being carried out after randomly generated delay times which will occur as shown below. Subsequent function and duration tests occur after the test interval settings as follows:

• Delay time to initial function test	randomly generated value between 0 and 7 days
• Delay time to initial duration test	randomly generated value between 4 and 52 weeks
• Function test interval	7 days
• Duration test interval	52 weeks

4.2 DALI MODE

The module is connected to the DALI bus via the da /da terminals, which are not polarity sensitive. Once the module has received a valid DALI command the module will enter DALI mode and will have the factory set default settings as detailed below:

• Prolong time	0
• Test delay time	0
• Function test delay time	0
• Duration test delay time	0



• Function test interval	7 days
• Duration test interval	52 weeks
• Test Execution timeout	7 days

Default values are defined in Table 1 of IEC 62386-202:2009 Digital addressable lighting interface – Particular requirements for self-contained emergency lighting. Settings may be modified via the DALI bus using the appropriate DALI configuration commands as listed in the DALI Standard IEC 62386-202. If the DALI bus is disconnected, the module does not revert back to self-test mode i.e. it will not randomly generate delay times, but will use the DALI mode settings.

5 TESTING OPTIONS WHEN OPERATING WITH A DALI BUS

Modules may be configured for two types of testing regimes when operating with a DALI bus.

5.1 LOCALLY CONTROLLED TESTING

Function and duration tests are initiated by the module i.e. modules perform automatic self testing according to the locally stored settings.

NOTE: The local settings for test intervals and delay times can be set up by the system commissioning engineer. If the settings are left as the factory default values then all the modules may enter test at the same time.

Polling is carried out by the master controller to monitor system operation and to log the test results.

5.2 CENTRALLY CONTROLLED TESTING

Function and duration tests are initiated by the master controller if the automatic self-testing is disabled. Automatic self-testing is disabled by setting the test interval times to zero.



6 LOCAL STATUS INDICATORS

A single bi-colour LED indicates the module status. The LED shows permanent green or flashing green when conditions are normal and permanent red or flashing red if a fault condition is present.

Two flashing rates are used:

• Slow flash:	0.5 Hz (a flash every 2 seconds)
• Fast flash:	2.0 Hz (a flash every 0.5 second)

A full description of the indicator codes is given in following table:

MODULE MODE	INDICATOR LED	STATUS	EMERGENCY LAMP
Mains operation mode Standby mode	Permanent green	Normal	Off
Function test in progress	Fast flashing green	Normal	On
Duration test in progress	Slow flashing green	Normal	On
Commissioning in progress	Slow flashing green	Normal	Off except during testing
Identification mode	Slow flashing alternating green/red	Normal	Off
Prolong mode	Off	Normal	On
Inhibit mode	Slow flashing double pulse green	Normal	Off
Rest mode	Green slow flashing double pulse off	Normal	Off
Emergency operation mode	Off	Normal	On



Lamp fault	Permanent red	Fault	Off
Battery / Test failure	Slow flashing red	Fault	Off
Battery charging failure	Fast flashing red	Fault	Off
Loss of mains and battery supply	Off	Fault	Off

7 TESTING

7.1 TYPES OF TEST

Modules perform two types of test as defined in IEC 62034:

7.1.1 TYPES OF TEST

A function test is a 30 second test that simulates a mains failure and checks the operation of the lamp from the battery supply.

The local LED indicator fast flashes green whilst the function test is in progress. If there is a failure during a function test (See section 8 - Fault conditions) the local LED indicator either changes to a permanent, or flashing red and the appropriate DALI status flag is set.

7.1.2 DURATION TEST

A duration test simulates a mains failure and checks the operation of the lamp from the battery supply for the rated duration of the module.

NOTE: The battery is required to be fully charged before a duration test can be started. If the battery is not fully charged the test is delayed (see section 7.3)

The local LED indicator slowly flashes green whilst the duration test is in progress. If there is a failure during a duration test the local LED indicator either changes to a permanent, or flashing red and the appropriate DALI status flag is set.



7.2 TEST INITIATION

Tests may be initiated in two ways:

7.2.1 TESTS INITIATED AUTOMATICALLY BY THE MODULE

Modules perform automatic function and duration tests as per locally stored settings.

7.2.2 TESTS INITIATED BY DALI COMMAND

Function and duration tests can be requested by the DALI commands 227: START FUNCTION TEST and 228: START DURATION TEST respectively.

7.3 DELAYED TESTS

If local conditions prevent a test from starting immediately, the start of the test is delayed and the module sets the respective 'test pending' flag in the EMERGENCY STATUS information byte.

A module may delay a test for the following reasons:

- **insufficient battery charge**
- **another test is in progress**
- **the permanent mains supply has been interrupted**
- **the module is waiting for a period of minimum risk (see section 7.4)**

A delayed test is executed automatically by the module once conditions permit. If a delayed test cannot be executed by the module within the TEST EXECUTION TIMEOUT period, this is then set in the respective part of the FAILURE information byte.

7.4 TESTING DURING PERIODS OF MINIMUM RISK

This is applicable to switch maintained applications only i.e. a switched live feed must be connected to the module. When automatic self-testing is enabled, the modules adjust the start time of tests automatically to coincide with periods when the switched live feed from the local switched lighting circuit is off i.e. a period of minimum risk.

If the switched live feed from the local switched lighting circuit is permanently on, tests are started following a period equal to half the TEST EXECUTION TIMEOUT.



NOTE: The testing during periods of minimum risk feature does not apply to tests that are requested via DALI command

8 FAULT CONDITIONS

The local LED indicator is permanently red or flashes red if a fault is detected by the module.

8.1 LAMP FAULT

For a lamp fault the local LED indicator remains permanently red and the appropriate DALI status flag is set.

A lamp fault may be recorded during a function or duration test.

8.2 BATTERY FAULTS

For a battery fault the local LED indicator flashes red at either a slow or fast rate according to the type of battery fault.

8.2.1 BATTERY FAILURE

If the battery is unable to supply the emergency lamp during a function test, then bit 2 ('battery failure') and bit 6 ('function test failed') of the FAILURE STATUS information byte are set. Additionally, the local LED indicator flashes red at a slow rate.

8.2.2 BATTERY CAPACITY INSUFFICIENT TO MEET RATED DURATION

If the battery has insufficient capacity to supply the emergency lamp during a duration test, then bit 1 ('battery duration failure') and bit 7 ('duration test failed') of the FAILURE STATUS information byte are set. Additionally, the local LED indicator flashes red at a slow rate.

8.2.3 BATTERY NOT CHARGING

If the module detects that the battery is not being charged, then bit 2 ('battery failure') of the FAILURE STATUS information byte is set. Additionally, the local LED indicator flashes red at a fast rate. **NOTE** The battery charging is



monitored continuously whilst the modules are in normal Mains operation/ Standby mode. Therefore, if normal charging is restored after a failure has been detected, the fault condition clears automatically.

8.3 DALI BUS FAULT

It is the responsibility of the master controller to report if a bus fault exists, and it should be noted that the module does not revert back to self-testing mode.

9. CLEARING FAULT CONDITIONS AND RE-COMMISSIONING

A test must be carried out to clear an indicated fault or to re-commission the system following a lamp or battery replacement.

9.1 CLEARING AN INDICATED FAULT

For a lamp or battery fault the cause of the fault must first be corrected and the appropriate test done in order to clear the indicated fault e.g. a duration test must be done to clear a duration fault.

NOTE: In the case of a battery charging fault the indicated fault clears automatically once the cause of the fault has been corrected and normal charging has been restored.

A test to clear a fault may be initiated by the method described in section 7.2.

9.2 RE-COMMISSIONING THE SYSTEM FOLLOWING A LAMP OR BATTERY

REPLACEMENT

An appropriate test must be carried out to re-commission the system following a lamp or battery replacement:

After a lamp replacement either a function or duration test is required.

After a battery replacement a duration test is required.

For modules connected to a DALI bus a function or duration test may be initiated via the appropriate DALI command.



For modules operating in stand-alone mode i.e. a DALI bus is not connected a duration test may be initiated by disconnecting all power to the module (mains and battery) and then re-connected to initiate self commissioning (see section 3).

10 ADDITIONAL OPERATING MODES ENABLED VIA DALI COMMAND

10.1 PROLONG TIME

Prolong time allows the emergency operation to be extended following the restoration of the mains supply. Typical applications include HID lamps, which when used for normal lighting may not re-light immediately following the restoration of the mains supply.

The prolong time may be set via DALI command from 0 to 127.5 minutes (in units of 0.5 minutes). The default factory setting is 0.

10.2 INHIBIT MODE

The activation of inhibit mode causes emergency lamps to be extinguished during active emergency mode automatically upon loss of the mains supply. Inhibit mode is activated via the DALI command 225: INHIBIT when the module is in normal operating (standby) mode.

NOTE: To prevent inadvertent loss of emergency operation, inhibit mode is automatically cancelled by the module after a 15 minute timeout period. To maintain the inhibit mode longer, requires the inhibit command to be repeated within the 15 minute timeout period, whereupon the module resets the timeout period for a further 15 minutes.

Whilst in inhibit mode the local LED indicator is off and slow flashes a double green pulse.

Inhibit mode may be cancelled (when the mains supply is present) via the DALI command 226: RE-LIGHT/RESET INHIBIT.



If the mains supply is lost, the operation is as described for rest mode (see section 10.3). Inhibit mode is then cancelled automatically when the mains supply is restored.

NOTE: It is the responsibility of the person operating the DALI system to ensure that the activation of inhibit mode does not result in a hazardous condition in the event of actual mains failure.

10.3 REST MODE

The activation of rest mode allows emergency lamps to be extinguished during active emergency mode to prevent unwanted discharge of batteries (e.g. if a building is unoccupied).

Rest mode is activated via the DALI command 224: REST when the module is in active emergency mode.

Whilst in rest mode the local LED indicator is green and slow flashes a double pulse 'off'.

Rest mode is cancelled automatically when the mains supply is restored.

NOTE: It is the responsibility of the person operating the DALI system to ensure that the activation of rest mode does not result in a hazardous condition in the event of actual mains failure.

10.4 IDENTIFICATION MODE

Identification mode allows for the physical location to be identified during system commissioning or when locating a fault.

Module start or restart a 30 second identification procedure when the DALI command 240: START IDENTIFICATION is received.

When the identification mode is active the local LED indicator alternates red and green at a slow flash rate.



11. TECHNICAL DATA

Power supply

- | | |
|-----------------------------|----------|
| • Operating voltage | 230 V AC |
| • Approx. power consumption | 4.3 W |

Connections

- | | |
|--------------------------|--|
| • Power Mains SM Version | 2,5 mm ² |
| • Power Mains FM Version | 1,5 mm ² |
| • DALI | Bus connection terminal
1,5 mm ² |

LED illuminant

- | | |
|---------------------------|----------------|
| • Color rendering index | 75 Ra |
| • Luminous flux | approx. 155 lm |
| • Energy efficiency class | A++ to A |

EEG note: This luminaire contains built-in LED lamps. The lamps cannot be changed in the luminaire.

Battery

- | | |
|--------------------|---|
| • Battery | rechargeable NiCd
battery 4.8 V/2000 mAh |
| • Charging time | 20 hours min. |
| • Battery Lifetime | 4-year |

Operation and display

- | |
|--------------------------|
| • Red / Green Status LED |
|--------------------------|

Temperature range

- | | |
|-------------|---------------|
| • Operation | 5°C to +35° C |
|-------------|---------------|

Environmental conditions

Humidity

max. 95% Non-
condensing

**Appearance design SM**

• Protection type	IP 20
• Protection class	I
• Installation type	Surface ceiling mounting
• Dimensions (H x W x D)	(190 mm x 190 mm x 44 mm)
• Weight (kg)	1,15 Kg
• Material and colour	powder-coated metal, White, similar RAL 9016

Appearance design FM

• Protection type	IP 20
• Protection class	II
• Installation type	Recessed ceiling mounting
• Dimensions (Diameter x D)	(Ø 55 mm x 25mm)
• Installation dimension	Installation depth 45 mm, installation hole size Ø 43 mm
• Weight (kg)	0,42 Kg
• Material and colour	UV stabilised polycarbonate, White similar RAL 9016

CE MARK IN ACCORDANCE WITH

• EMC 2004/108/EC	EN 55015:2006 +A1:2007+A2:2009 EN 61547:2009 EN 61000-3-2:2006 +A1:2009+A2:2009 EN 61000-3-3:2008
• LVD 2006/95/EC	EN 60598-1:2008 EN 60598-2-22:1998 +A1:2003+A2:2008 EN 62493:2010 EN 62471:2008
• RoHS 2011/65/EU	EN 50581:2012



12 ESYLUX MANUFACTURER'S GUARANTEE

ESYLUX products are tested in accordance with applicable regulations and manufactured with the utmost care. The guarantor, ESYLUX Deutschland GmbH, Postfach 1840, D-22908 Ahrensburg, Germany (for Germany) or the relevant ESYLUX distributor in your country (visit www.esylux.com for a complete overview) provides a guarantee against manufacturing/material defects in ESYLUX devices for a period of three years from the date of manufacture. This guarantee is independent of your legal rights with respect to the seller of the device.

The guarantee does not apply to natural wear and tear, changes/interference caused by environmental factors or damage in transit, nor to damage caused as a result of failure to follow the user or maintenance instructions and/or as a result of improper installation. Any illuminants or batteries supplied with the device are not covered by the guarantee.

The guarantee can only be honoured if the device is sent back with the invoice/receipt, unchanged, packed and with sufficient postage to the guarantor, along with a brief description of the fault, as soon as a defect has been identified. If the guarantee claim proves justified, the guarantor will, within a reasonable period, either repair the device or replace it. The guarantee does not cover further claims; in particular, the guarantor will not be liable for damages resulting from the device's defectiveness. If the claim is unfounded (e.g. because the guarantee has expired or the fault is not covered by the guarantee), then the guarantor may attempt to repair the device for you for a fee, keeping costs to a minimum.