











IF YOU THINK SAFETY IS EXPENSIVE TRY AN ACCIDENT

"Take a step towards a safer environment with our Visible Solutions"



INTRODUCTION

Low Location Lighting Systems plays an crucial part onboard ships and offshore platforms in case of a sudden electrical failure when facing a black-out, or heavily darkened situation due to other factors such as smoke development. The Photoluminescent Low Location Lighting Systems as well as the Electrical Powered Low Location Lighting Systems are therefore necessary for guiding people towards safety. As stipulated according to IMO, SOLAS and ISO regulations, ships carrying more than 36 passengers shall be equipped with such systems to efficiently mark obstacles, stairs, routes to the exits, and emergency exits. Our photoluminescent and Electrical powered (LED) systems are used to create the optimal way to safety for passengers and personnel.

Signwell realizes new-/and refurbishment projects of implementing Low Location Lighting Systems, **3L-PL**TM / **3L-EP**TM and conducts the **3L-SI**TM, Low Location Lighting System Inspections /certifications of your system.

RULES & REGULATIONS

The below rules, regulations and standards describe the technical performance and properties of the products used, how to install these products/systems and how to certify and maintain these products and systems.

Standard	Description
IMO Resolution A.752 (18)	Guidelines for the evaluation, testing and application of LLL on passenger ships
SOLAS Chapter II-2 regulation 13	Means of escape - Marking of escape routes
European Directive 2002/25/EC	Safety rules and standards for passenger ships
ISO 15370:2021	Low Location Lighting (LLL) on passenger ships
ISO 16 <mark>069</mark>	SWGS - Safety Way Guidance Systems
ISO 24 <mark>409-</mark> 2:2014	Ships and marine technology Design, location and use of shipboard safety signs, fire control plan signs, safety notices and safety markings
ISO 17 <mark>398:</mark> 2004	Safety colours and safety signs - Classification, performance & durability of safety signs

REQUIREMENTS

Signwell is a DNV approved specialist for Low Location Lighting systems on passenger and RoPax vessels. IMO & SOLAS regulations require that ships carrying more than 36 passengers shall be fitted with a Low Location Light system. Resolutions A.752(18) & ISO15370:2021 details system requirements and testing procedures:

- The installed material must be class/Wheelmark approved
- All escape routes, including stairs, must be marked with a Low Location Lighting System
- Where stairs or corridors are wider than 200cm, the Low Location Lighting System shall be installed on both sides of the corridor.
- Escape signs shall be located at each EXIT on the same side as the door handle (as in the picture).
- Fire- and water tight doors shall be marked to show how the door is opened.
- The Low Location Lighting System must be placed no higher than 30cm above the deck at all points of the escape route.
- Photoluminescent Low Location Lighting Systems must have their luminescence tested every 5 year by an authorized body.





ELECTRICAL POWERED LOW LOCATION LIGHTING SYSTEM



SIGNWELL VISIBLE SOLUTIONS

LOW LOCATION LIGHTING — ELECTRICAL POWERED SYSTEM





The LED Low Location Lighting system (Electrical Powered Low Location Lighting System) is designed for Escape Route Guidance. Its principle is the same as the Photoluminescent LLL systems, but this product does not need a light source to glow, its glow does not fade over time and the system does not require an audit every

5 year by

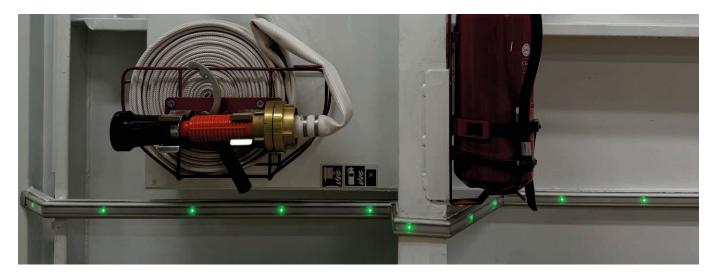
an authorised body. Due to its great flexibility, the installation can be done, for example, on curved walls. We produce, sell and install Low Location Lighting systems in accordance to IMO RESOLUTION A.752(18) and ISO 5370:2021. The turnkey service includes: mapping, planning and professional installation services.



CERTIFICATION AND APPROVALS

Low Location Lighting Systems comply with the environmental conditions and test procedures as defined in the requirements of the current editions of:

- IEC Pub. 598-2-22
- Regulation for the Performance of Type tests for Electric Appliances Components
- Type approval of instrumentation and automation equipment, DNV MED



TECHNICAL DATA LED-STRIP

• Standard LED Distance: 200mm

• High brightness LEDs colour "true green" 720 mcd

• IP Grade: IP67

• Operating temp.: -15°C to + 55°C

• Life time: > 150 000 hours

Due to high flexibility, LED-Strip can follow even 90°
 corners or tight curves without any electrical interruption



SIGNWELL VISIBLE SOLUTIONS

LOW LOCATION LIGHTING ELECTRICAL POWERED SYSTEM





POWER BOX UNIT (PSU)

The Power Box Unit (PSU) feeds the system with power (each LED-strip is fed from both side and two different PSUs for safety reasons). System activation can be done from the bridge either by an input signal (from SMS- or emergency shut down-system) on board or manually from the bridge by switching the system simply ON/OFF.

TECHNICAL DATA

 Nominal Voltage: 115-230 V AC/DC
 Average Power Consumption: 77 VA (under fully load)

Output Voltage: 22 V DCOutput Power: 100 W

• Capable to feed up to 1.000 m LED-strip

• IP Grade: IP 55

Batteries: 3 Sealed Lead Acid (7.26 kg)
Housing: Metal, in colour RAL 7035 (grey)
Battery charging also under systemactivation

mode!

• Dimension: a) incl. Batt.: 445 x 340 x 127 mm b) excl. Batt.: 280 x 340 x 127 mm

• Weight: a) incl. Batt.: ~ 16.85 kg b) excl. Batt.: ~ 9.60 kg

NO extra housing for batteries required (!)

• Cable Glands: 9 x grommets in different sizes

• Terminal configuration plan inside





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LOW LOCATION LIGHTING — ELECTRICAL POWERED SYSTEM



SIGNWELL





PROFILE TYPES

Our Electrical powered Low Location Lighting System can be installed in two different ways, floor mounted or wall mounted. Electrical Low Location Lighting systems goes under the category "Active systems" whereas Photoluminescent Low Location Lighting Systems goes under "Passive Systems".

SIGNWELL offers turnkey services for both systems, mostly for new building projects but also for refurbishment projects on all scales. Our range of profiles and methods varies from integrated profile systems to wall mounted and floor mounted profiles.

STANDARD ALUMINIUM PROFILES



- Standard colour: Anodised silver
- Further colours on request e.g. Black anodized.
- Protection covers and end-caps



Integrated floor profile CC38/10

B00 803 111 00



Integrated floor profile CC38/15.5

BOO 803 011 00



Double rounded edge profile RR37/10

B00 803 091 00



Integrated profile U22/12

B00 803 021 00



Single rounded edge profile RS34/10

B00 803 071 00

LOW LOCATION LIGHTING **ELECTRICAL POWERED SYSTEM**











Single rounded edge End-cap (Right) RS34/10

B00 806 079 00



Double rounded edge profile RS37/10

B00 806 091 00



Single rounded edge End-cap (Left) RS34/10

B00 806 089 00



35mm long PC-End Cover B00 803 629 01



Integrated profile End-Cap U22/12 PC-End Cap B00 806 021 00



Decor foil with holes B00 802 519 11



Integrated floor profile End-Cap CC38/15.5 B00 806 209 00



Decor foil without holes B00 803 519 11



Double rounded edge End-cap RR37/10 PC-End Cap

B00 806 091 00



Clear polycarbonate (PC-) Protection cover B00 803 610 00



Integrated floor profile End-Cap CC38/10 B00 806 109 00



2-wire LED-Strip 200mm distance Green colour

B00 807 320 00

LOW LOCATION LIGHTING ELECTRICAL POWERED SYSTEM









CUSTOM SPECIAL PROFILE TYPES



Skirting Board Profile

- Original RIVINOX-/ BEZAULT-/ SCHWEPPER Skirting board profiles
- Available colours: GOLD and SILVER
- Other skirting board profiles available on request



Wall recessed option (w/o profile)

- Clipped- in from behind into the wall panels
- Installed into the pre-manufactured wooden skirting board profiles (pre- manufactured cutouts)



Polycarbonate Profile

- Available in all RAL colours (Standard colours is RAL7026)
- Non toxic, halogen free and fire retardant
- Protection covers and end-caps in same quality













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Signwell realizes new-/or refurbishment projects of implementing Low Location Lighting Systems, **3L-PL™** / **3L-EP™** and conducts the **3L-SI™**, Low Location Lighting System Inspections /certifications of your system.

The New Generation of Low Location Lighting Systems, 3L-PL™ (non PVC/halogen free) is a pioneer and a game changer on the market. With its high quality and environmental footprint it is by far the best choise of PLLLL today on the Maritime Industry market. Today most sign makers use PVC, despite the fact that it is the single most environmentally damaging of all plastics. PVC contains halogens and their toxicity of smoke is of highest concern within enclosed spaces, which you will find onboard any ship or offshore platform.



SIGNWELL

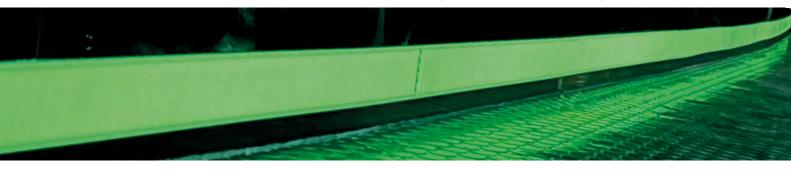
PHOTOLUMINESCENT LUMINANCE PROPERTIES



The New Generation instead of PVC

Our **3L-PL™** Low Location Lighting Systems are a remarkable step towards the future. With its standard exceeding performance, up to 4 times better than other Photoluminescent LLL systems on the market. The results are not only

achieved with its performance, but also installation vice and by taking energy savings into consideration with The New Generation System onboard. Expected lifetime of **3L-PLTM** is 10+years and comes with a 10 year warranty.

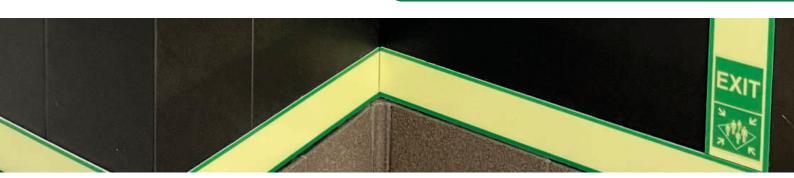


LUMINANCE PROPERTIES:

Applicable Standards and Resolutions vs. SafeSigns	Luminescent intensity (mcd/m²) (After removing the existing light)	
	10 minutes	60 minutes
IMO Res. A. 752(18)	15 mcd/m²	2 mcd/m²
ISO 15370	15 mcd/m²	2 mcd/m²
DIN 67 510-4	23 mcd/m²	3 mcd/m²
ISO 17398 Class A	25 mcd/m²	3 mcd/m²
ISO 17398 Class B	50 mcd/m²	7 mcd/m²
ISO 17398 Class C	140 mcd/m²	20 mcd/m ²
ISO 17398 Class D	260 mcd/m²	35 mcd/m ²
ISO 17398 Class E	400 mcd/m²	55 mcd/m²
ISO 17398 Class F	520 mcd/m²	70 mcd/m ²
SafeSign XL	Class B+	Class B+
SafeSign XXL	Class C+	Class C+
SafeSign XXXL	Class E+	Class E+
Mentioned values are calculated f	or 75mm LLL systems.	

BENEFITS COMPARED TO OLDER GENERATION ALUMINIUM PROFILE SYSTEMS:

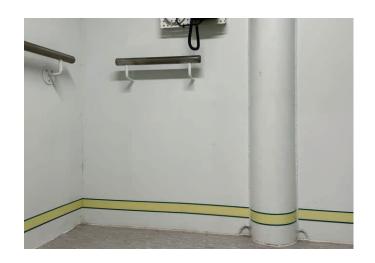
- No lost or loose end caps
- No gaps due to shrinking
- No more dirt collections on profile
- No mechanical damages
- No more dirt on insert which cannot be removed
- Not as time consuming to replace
- No unnecessary weight due to profiles
- No shivering from loose profiles after a few years of service
- Glossy finish
- PVC-/ Halogen Free
- UV-resistant
- Recyclable
- Profileless configuration
- No end-caps needed
- 10 + years service life
- 10 year warranty
- Weight saving-> Energy saving
- Easy to install



THE NEW GENERATION OF PL LOW LOCATION LIGHTING SYSTEMS 3L-PL

Our **3L-PL™** Low Location Lighting Systems is the easiest system on the market to install. The sytsem is a Non PVC/ Halogen-free product with a strong self adhesive backing for easy application. With its glossy finish the end product is easy to clean and has a premium appearance.

The standard **3L-PL™** comes with two 5mm green edges. With its standard exceeding performance, it is 4 times stronger than the PVC containing systems that are used.



Article number	Description	Dimensions	Quality	Thickness
PL060CGN	3L-PL™ LLL Strip, Pet-X green edges	1 m x 60 mm (50 mm)	C+ (XXL)	1,5 mm
PL070CGN	3L-PL™ LLL Strip, Pet-X green edges	1 m x 70 mm (60 mm)	C+ (XXL)	1,5 mm
PL100CGN	3L-PL™ LLL Strip, Pet-X green edges	1 m x 100 mm (90 mm)	C+ (XXL)	1,5 mm
PL040CN	3L-PL™ LLL Strip, Pet-X neutral	1 m x 40 mm	C+ (XXL)	1,5 mm
PL050CN	3L-PL™ LLL Strip, Pet-X neutral	1 m x 50 mm	C+ (XXL)	1,5 mm
PL070CN	3L-PL™ LLL Strip, Pet-X neutral	1 m x 70 mm	C+ (XXL)	1,5 mm
PL060CGY	3L-PL™ LLL Strip, Pet-X grey edges	1 m x 60 mm (50 mm)	C+ (XXL)	1,5 mm
PL070CGY	3L-PL™ LLL Strip, Pet-X grey edges	1 m x 70 mm (60 mm)	C+ (XXL)	1,5 mm
PL100CGY	3L-PL™ LLL Strip, Pet-X grey edges	1 m × 100 mm (90 mm)	C+ (XXL)	1,5 mm

3L-PL™ LLL Strip, Pet-X green edges



3L-PL™ LLL Strip, Pet-X grey edges



3L-PL™ LLL Strip, Pet-X neutral



Approvals

- DNV MED
- Wheelmark



Standards

• Complies with IMO Resolution A. 752 (18) and ISO standard 15370



Note; The width of the photoluminescent material in the strips with the green edges is shown in parentheses, the width of the green edges is 2×5 mm.





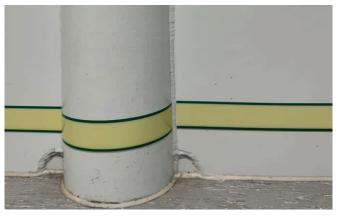




THE NEW GENERATION OF LOW LOCATION LIGHTING SYSTEMS

The benefits of implementing The New Generation of Low Location Lighting are many. Our innovative product offers you the following:

- Glossy finish
- PVC Free
- Halogen Free
- Easy to wipe clean
- UV resistant
- Recyclable
- No end caps needed
- 10 year warranty
- >10 years life durability
- No shrinking
- 50% timesaving on installation
- Self-adhesive backing
- Salt Water resistant
- Easy to replace if needed
- Weight saving -> energy saving
- No shivering
- Excellent photoluminescent capability
- Flexible material, great for installation



Integration into the architecture (Installation on curved pillar)



Flexible installation



Flexible installation

Green edge standard to indicate safety



Grey edge option





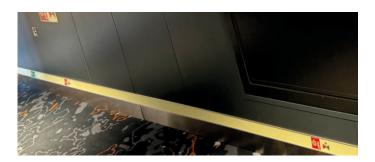
SIGNWELL®





Our range of the old generation LLL profile system is consisting of extruded aluminum profiles and rigid photoluminescent strips. We offer two different models, flat profiles and angled. All insert strips are DNV certified. This system is from the time when photoluminescent materials did not have as good performance as the materials we have today. Therefore the insert strip system was created, in order to be able to change the strips

when they did not charge enough anymore, also for charging better light from the light source. This system requires end-caps, and is overall more complex to install and adds a lot of extra unnecessary weight. We do not recommend to install it on new building vessels.



Approvals

- DNV
- Wheelmark

Standards

• ISO standard 15370

Article number	Description	Dimensions	Quality
IPA055CN	LightLine Insert PVC for angled profile	1 m x 55,4 mm	C+ (XXL)
PAA60-100	Insertprofile ALU angled (insert 55,4 mm)	1 m x 60 mm	Alu. anodised
PAA60-300	Insertprofile ALU angled (insert 55,4 mm)	3 m x 60 mm	Alu. anodised
ENDCAP-AL	LLL endcap angled profile left	15 mm x 60 mm	Plastic
ENDCAP-AR	LLL endcap angled profile right	15 mm x 60 mm	Plastic
IPF056CN	LightLine Insert PVC for flat profile	1 m x 56 mm	C+ (XXL)
PAF60-100	Insertprofile ALU flat (insert 56 mm)	1 m x 60 mm	Alu. anodised
PAF60-300	Insertprofile ALU flat (insert 56 mm)	3 m x 60 mm	Alu. anodised
ENDCAP-F	LLL endcap flat profile	4 mm x 53 mm	Alu. anodised













Profile + insert Low Location Light System



Dust and dirt collector

The OLDER GENERATION ALUMINIUM PROFILE SYSTEMS:

The previous generation of Low Location Lighting Systems, Profile + insert:

- PVC containing
- Not halogen Free
- Not as easy to clean
- Needs end caps (that will get lost after heavy use)
- Shrinks
- Time consuming to install
- Harder to replace, due to profile.
- Adds a lot of extra unnecessary weight to the ship
 -> energy consuming
- Can start to shiver after some years in use
- Damages more visible due to both damaged profiles and inserts
- Gaps when end caps falls off



A result of loose endcaps



Damaged profile and insert





A result of loose endcaps

SIGNWELL

LOW LOCATION LIGHTING MINI SYMBOLS





Low Location Lighting Systems shall include all necessary symbols for the escape route and fire-fighting equipment in addition to the IMO signs at eye level, according to ISO 15370 and SOLAS regulations. Our LLL mini symbols can be self-adhesive transparent stickers, SafeSign Pet-X halogen and PVC free signs or acrylic signs. The LLL mini symbols shall be the minimum height of 50mm according to the ISO 15370 standard.





EEBD (em. breathing device) 50 × 50 mm **RS0009**



Emergency exit (left hand) 50 x 50 mm **ESOO01**



Shipboard assembly station 50 x 50 mm **ESOO04**



Escape direction, arrow (45°) 50 x 50 mm **ESO007**



Escape door opens left 100 x 50 mm **ES1002**



Escape route to the right 100 x 50 mm **ES1005**



Escape downstairs right 100 x 50 mm **ES1007**



Escape upstairs right 100 x 50 mm **ES1009**



Emergency exit (right hand) 50 x 50 mm **ESO002**



Escape direction, arrow (90°) 50 x 50 mm **ESO006**



Escape route forward/Esc. door 100 x 50 mm **ES1001**



Escape route to the left 100 x 50 mm **ES1004**



Escape route downstairs left 100 x 50 mm **ES1006**



Escape upstairs left 100 x 50 mm **ES1008**



Assembly station forward (througt door) 100 x 50 mm **ES1030**



LOW LOCATION LIGHTING MINI SYMBOLS



Assembly station left 100 × 50 mm **ES1032**



Assembly station right 100 x 50 mm **ES1033**



Assembly station downstairs left 100 x 50 mm **ES1034**



Assembly station downstairs right 100 x 50 mm **ES1035**



Assembly station upstairs left 100 x 50 mm **ES1036**



Assembly station upstairs right 100 x 50 mm **ES1037**



Assembly station forward/up 100 x 50 mm **ES1038**



Lifeboat left 100 x 50 mm **ES1052**



Lifeboat right $100 \times 50 \text{ mm}$ **ES1053**



Escape route forward left vertical 50 x 100 mm **ES1101**



Escape route forward right vertical $50 \times 100 \text{ mm}$ **ES1102**



Escape route left vertical 50 x 100 mm **ES1103**



Escape route right vertical 50×100 mm **ES1104**



Assembly station forward vertical 50 x 100 mm **ES1105**



Assembly station left vertical 50 x 100 mm **ES1106**



Assembly station right vertical 50 x 100 mm **ES1107**



LLL Stairs up to left 50×50 mm **ES1120**



LLL Stairs up to right 50 x 50 mm **ES1121**

SIGNWELL VISIBLE SOLUTIONS

LOW LOCATION LIGHTING MINI SYMBOLS





Escape route forward left vertical 50 x 200 mm **ES2501**



Escape route forward right vertical $50 \times 200 \text{ mm}$

ES2502



Assembly station forward vertical 50 x 200 mm **ES2503**



Fire extinguisher 50 x 50 mm **FS0001**



Fire alarm call point 50×50 mm **FS0002**



Fire hose reel 50×50 mm **FS0003**



Unconnected fire hose 50 x 50 mm **FS0004**



Fire hydrant 50 x 50 mm FC0048

Material options:

- Transparent laminated vinyl
- New Generation PVC Free PET-X



LOW LOCATION LIGHTING

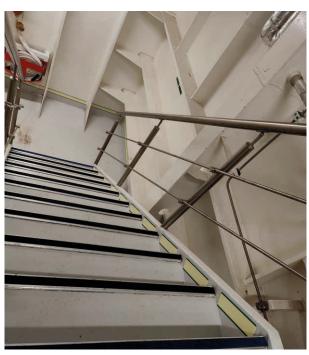
ADDITIONAL LLL PRODUCTS

Low Location Lighting Systems shall include all necessary symbols for the escape route and fire-fighting equipment in addition to the IMO signs at eye level, according to ISO 15370 and



After installation of symbols.

SOLAS regulations. Our LLL mini symbols can be placed in staircases onto our Stair-Line LLL. The LLL mini symbols shall be the minimum height of 50mm according to the ISO 15370 standard.



Before installation of symbols.

Example of how to create a clear message and not:



3L-PL™ LLL Strip, Pet-X green edges



3L-PL™ LLL Strip, Pet-X grey edges



Article number	Description	Dimensions	Quality	Thickness
STL060200GN	3L-PL™ LLL Strip, Pet-X green edges	200x60mm (50mm)	C+ (XXL)	1,5 mm
STL060150GN	3L-PL™ LLL Strip, Pet-X green edges	150x60mm (50mm)	C+ (XXL)	1,5 mm
STL060200GY	3L-PL™ LLL Strip, Pet-X grey edges	200x60mm (50mm)	C+ (XXL)	1,5 mm
STL060150GN	3L-PL™ LLL Strip, Pet-X grey edges	150x60mm (50mm)	C+ (XXL)	1,5 mm
STL060200N	3L-PL™ LLL Strip, Pet-X neutral	200x60mm (50mm)	C+ (XXL)	1,5 mm
STL060150N	3L-PL™ LLL Strip, Pet-X neutral	150x60mm (50mm)	C+ (XXL)	1,5 mm

LOW LOCATION LIGHTING



ADDITIONAL LLL PRODUCTS

The Trail-Line is a better solution instead of dots, where they are forming a visual line that is clearer to follow than a row of dots. Typically used in spaces where larger errors have been made in the building phase, e.g. walls or a type of fence should have been built.







Article number	Description	Dimensions	Quality
DOT090N-A	3L-PL™ LLL Traildot anti-slip neutral	Ø 90 mm	C+ (XXL)
DOT090A-A	3L-PL™ LLL Traildot anti-slip arrow	Ø 90 mm	C+ (XXL)
TRL050200N-A	3L-PL™ LLL Trail-Line, anti-slip neutral	200x50mm	C+ (XXL)
TRL050200A-A	3L-PL™ LLL Trail-Line, anti-slip arrow	200x50mm	C+ (XXL)







LOW LOCATION LIGHTING INSTALLATION

IMPLEMANTATION OF THE LOW LOCATION LIGHTING SYSTEMS



Signwell is your partner for newbuilding- and refurbishment projects world wide. We take care of the entire process. Everything from planning to realisation of Electrical powered or Photoluminescent Low Location Lighting Systems.

Our team will do the engineering and layout and produce the LLL in our production facilities, in order for us to adequately realise your deliveries and projects. We produce the LLL system by appropriate quality requirements, to endure the environment and desired life span. Our professional installation team specialized in Electrical (LED) Powered and Photoluminescent (PL) Low Location Lighting Systems, will take care of the implementation, and make sure that the 3L System is correctly installed.

Are you in need of a new system or in need for replacement of your old one? Contact our team today and get started.





LOW LOCATION LIGHTING INSTALLATION, MEASUREMENT AND CERTIFICATION











INSPECTION OF THE SYSTEM

Signwell is certified by DNV to conduct Low Location Lighting System measurement services for re-certification.Photoluminescent Low Location Lighting Systems shall be tested every 5 years. Our engineers will conduct the **3L-SI**™ ,Low Location Lighting System Inspection. A popular choice of our clients is a combined safety signage system check together with the inspection that the signage system is in good condition.

What to take into concideration

- Light source(s) (we have a broad range of LED Lighting solutions)
- The general condition of the material

What will you get?

After Signwells **3L-SI**, the Low Location Lighting System Inspection is done it will be finalized and the full report book will be handed over to the owner. SIGNWELLS **3L-SI**[™]Report book includes the full measurement map containing all information needed and comes with instruction of how to maintain the system. If our engineers find anything worth to point out it will be written in the conclusion section.

Our services:

- Electrical Powered / Photoluminescent LLL system measurements (DNV certified)
- Refurbishment services





