

Light Efficiency Innovations – LED with LMS



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Light Efficiency Innovations – LED with LMS



Glamox Inc. (Canada) – Introduction / experience

LED lighting on Canadian Ferries

LMS – Light Management System

Norled AS – brief case study on LED upgrading with LMS

Glamox Inc. (Canada) – Who Are We?



Glamox Inc. (Canada) – Who are we?

Canadian Manufacturer and Supplier of Marine & Offshore Lighting

- Established in 1991 in Newfoundland
- Production facility and main offices in Mount Pearl, NL
- Full manufacturing plant – CNC punch / brake / bending equipment, welding, powder coating and bake oven, assembly lines & warehousing
- Quality rugged marine lighting solutions designed for long life
- Designed to CSA/UL standards, supplying to Canada, US & Worldwide
- Part of the larger **Glamox** GMO Group of Companies, Norway:
 - ❖ Largest Marine & Offshore lighting organisation globally
 - ❖ Includes brands such as **Aquasignal, Glamox, Norselight, LINKSrechts**



Glamox Inc.



Marine Experience - Canada

Glamox Inc. – Marine Experience - Canada



Extremely active in all marine sectors across Canada for 30 years

This includes many new build programs and significant retrofit work - all vessel types

Current Canadian New Builds – Federal (NSS):

Glamox full LED ships lighting packages -

Currently supplying 6 x **AOPS** program at Irving Shipbuilding

Selected for the 2 x **JSS** program at Seaspan Shipyards

Selected for the **OOSV** program at Seaspan Shipyards



Glamox Inc. – Marine Experience – NB Ferries



Recent NB Ferry projects in Canada:

2 x STQ Ferries – Dual Fuel LNG @ Davie

BC Ferries - Baynes Sound Connector @ Seaspan



Glamox Inc. – Marine Experience – NB Ferries Overseas



Recent Canadian Ferries NB overseas – Glamox Group:



NL Government

MV Veteran
MV Legionnaire

@Damen, Romania



Seaspan Ferries

MV Seaspan Swift
MV Seaspan Reliant

@Sedef, Turkey

Owen Sound
Transportation

MV Pelee Islander II

@Asenav, Chile



BC Ferries

2 x Island Class

@Damen, Romania



LED - New Build Ferries

LED Lighting – New Build Ferries

Most new builds now are specified with LED

Providing additional value from Day 1

- ❖ Increased energy efficiencies
- ❖ reduced power consumption
- ❖ reduced maintenance

Helps reduce CO2 & NOx emissions

With new advancements in Ferry technology:

- Hybrids, Fully Electric etc.

- ❖ energy efficiencies become even more important



LED Upgrades - Existing Ferries

LED Lighting – Existing Ferry Upgrades

Many Ferry owners are being pro-active with energy saving measures and upgrading their fleets

This includes changing to LED Lighting.

Reduces power consumption and reduced maintenance costs – typically 50% energy saving with LED



LED Lighting – Existing Ferry Upgrades

Reduced load - could release some valuable electrical capacity on board

Reduced emissions – environmental benefit

Short Payback time – based on energy and maintenance savings



LED Lighting + Light Management System (LMS)



What is LMS

Essentially a light control system

Provide the correct lighting for any particular area whilst maximizing energy savings

As simple as a photocell for one light, through to an intelligent network system of devices

Lighting on most ships are typically ON /OFF - most of the time are fully ON

Therefore often wasting energy.

Implementing a control system will reduce redundant lighting, thus providing savings

LED Lighting + LMS – A NORLED Case Study



Norled AS

One of Norway's largest ferry and express boat operators

Operate approx. 80 vessels

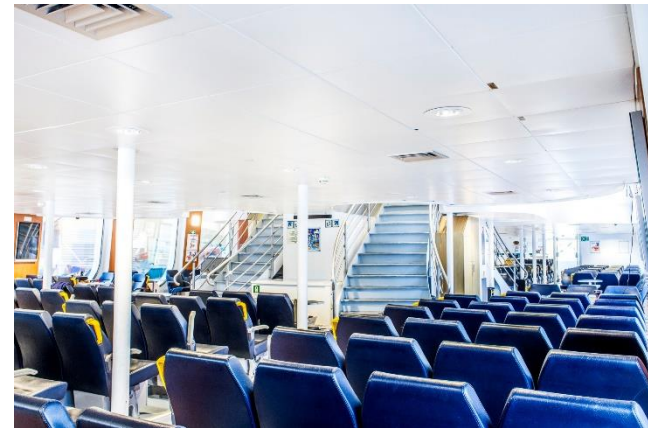
Significant investment in new types of vessels

Glamox presented concept for upgrading 3 existing ferries:

- [MS Dronningen](#), [Kongen](#), [Prinsen](#) – conventional lighting

Ferries are approx 50m in length, approx. 600 passengers

Diesel Fuel powered



LED Lighting + LMS – A NORLED Case Study



Norled AS – MS Dronningen

Project concept was to upgrade inside lighting to LED

Additionally add simple LMS solutions - maximise efficiency

Passenger areas, machinery spaces, crew spaces

Worked together with GK Electro – Electrical Contractor

Power logging carried out both before and after upgrade



LED Lighting + LMS – A NORLED Case Study



Norled AS - LED

Total of 327 lights changed to LED

Downlights were changed out in passenger and crew areas

Accent lighting replaced

Machinery space lighting upgraded



LED Lighting + LMS – A NORLED Case Study



Norled AS - LMS

Passenger area fittings pre-installed with dimming control (DALI)

Stand-alone daylight sensors also fitted to monitor ambient light

Control panel – 4 different light output settings

UMS / other spaces – motion sensors

Crew area downlights fitted with dimmers

Outside areas fitted with proximity sensors, photocell sensors



LED Lighting + LMS – A NORLED Case Study



Norled AS - LMS



New cabling run in passenger areas – for power & DALI communication – plug and play connection



LED Lighting + LMS - Video

Click on below picture for hyperlink to 1 minute video demonstrating the retrofitting of the lights



LED Lighting + LMS – A NORLED Case Study



Norled AS - LMS in action

Passenger areas - daylight sensors determine the current ambient light

Based on a set light level, sensors will send signal to light fixtures to either increase or decrease accordingly (DALI communication)

For example - on a bright sunny day, lights will be dimmed right down

Control panel – 4 light output settings for the passenger area lights

Machinery spaces – motion sensors – 30 minute activation – 3 zones
(Note – Emergency lighting remained fully on – not part of LMS)



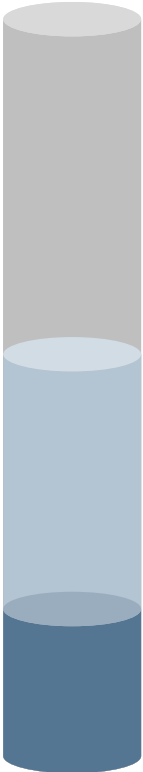
LED Lighting + LMS – A NORLED Case Study



Norled AS - Outcome – report by GK Electro

Energy saving in KW/h	187,500 KW/h
Energy saving by converting conventional lighting to LED (calculated)	50%
Energy saving by converting to LED and including LMS system (measured)	87%
CO2 reduction	94 Tonnes
Nox reduction	2.72 Tonnes
Overall annual savings for energy, service, maintenance costs	\$60,000 / Year

LED Lighting + LMS – A NORLED Case Study



216 067 kWh

108 033 kWh

28 561 kWh

Old
installation

New installation
with LED
(calculated)

New installation
with LED with LMS
(measured)

108 000 kg CO₂
3 160 kg NO_x

53 980 kg CO₂
1 580 kg NO_x

14 000 kg CO₂
420 kg NO_x



LED Lighting + LMS – A NORLED Case Study



Norled AS – LMS Conclusion

LED upgrading - significant effect on power consumption reduction and maintenance

LMS system - significant effect on reduction of light use (further power savings)

LMS increases life of LED fittings through less use - reduces maintenance time and costs further

Payback time within 3 years – significant savings year 4 onwards (these were built 2009)

* This particular refit was carried out in a 2 week period

LED Lighting + LMS – Smart Lighting / IoT

With LMS, the lights can be much more than illumination

The lighting system can in fact be an onboard communication system – some ideas on next slides



LED Lighting + LMS – Smart Lighting / IoT

All settings are set/changed using the App via Bluetooth



Detection sensitivity

Choose between 5 levels. Used if sensor detects ventilation shafts or similar.

Brightness set point value (lux)

Can be set directly or measured and then entered.

Switch off delay time

The time it takes from the room is absent until the light is turned OFF

LED display movement

The sensor gives a red LED light when it detects movement.

LED Lighting + LMS – Smart Lighting / IoT

With tunable white technology, we could change colour temperature of the light: warm white - cool white

Can improve passenger comfort and increase crew performance (Human Centric Lighting)



LED Lighting + LMS – Smart Lighting / IoT



AL60-W62 SMR-SEN



TL44-S SMR-SEN

Products with integrated sensors



AL60-SQ340 SMR-SEN



MIR LED SMR-SEN

LED Lighting + LMS – Smart Lighting / IoT

Heat Mapping – provides an overview of which areas are in use, by detecting human movement

Analysing the use of an area can help safety plans, manpower allocations, maximize retail revenue etc.



LED Lighting + LMS – Smart Lighting / IoT



LED Lighting + LMS – Smart Lighting / IoT



Thank you!



Commercial
marine



Cruise &
Ferry



Navy



Offshore
energy



Onshore
energy



Recreational
boats

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