THE STRONGEST LINK.

STAHL

LIGHTING THE WAY IN HAZARDOUS AREAS

Reliable, efficient and intelligent LED lighting solutions

SMART LIGHTING SOLUTIONS WITH EXPLOSION PROTECTION

It's only possible to work safely if you can see clearly. Proper lighting has a major role to play here. This is all the more important in hazardous areas – whether in a refinery, on an oil rig, in a chemical plant, in clean rooms or in machinery and plant construction. Intelligent LED lighting solutions for hazardous areas are essential. This is because standard light fittings for industrial facilities don't meet the stringent safety requirements of hazardous areas.

R. STAHL is one of just a handful of suppliers in the world to specialise in complete electrical explosion protection. This makes us your expert point of contact for explosion-protected lighting solutions. We put all of our explosion protection expertise into our diverse range of light fittings and our specialist services. We support you throughout the entire product life cycle with our services.

All of our light fittings and lighting devices boast LED technology. This offers the benefit of a long service life and exceptional luminous efficacy with low energy and maintenance costs. What's more, this technology can be used to create digital solutions, known as smart lighting.

The portfolio of state-of-the-art products spans general lighting, pendant light fittings and floodlights, through to hand lamps and emergency lighting – thereby covering a wide range of industrial lighting tasks in hazardous areas.

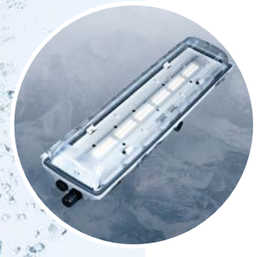
At our factories in Weimar and Chennai, we have two centres of excellence for designing, developing and producing lighting technology for the most diverse applications. Our aim is to provide system planners and operators with solutions which ensure reliable, low-maintenance and long-lasting operation in many different operating conditions worldwide.

DALI: DIGITAL LIGHT MANAGEMENT IN HAZARDOUS AREAS

DALI enables individual lights and entire lighting systems to be digitally networked, switched, controlled and monitored. Operation is simple using a Web browser via smartphone.

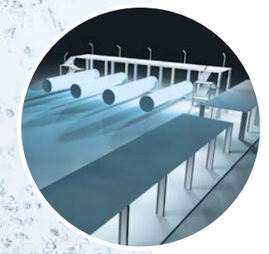
LIGHT FITTING PORTFOLIO FOR ALL REQUIREMENTS

Thanks to the diverse product range, R. STAHL can provide the perfect solution for any lighting task. For all industries – worldwide!



LATEST LED TECHNOLOGY – LONG-LASTING AND EFFICIENT

Our extensive expertise in LED technology ensures that all avenues are open to you when it comes to state-of-the-art, energy-efficient lighting solutions that require minimal maintenance.



LIGHTING DESIGN – TAILORED, COMPLIANT, ECONOMIC

By means of judicious lighting design, we ensure that both inside and outside spaces are illuminated in accordance with the relevant directives. This also includes escape route lighting.

EMERGENCY LIGHTING SYSTEMS – SAFETY INSTEAD OF DARKNESS

R. STAHL manufactures self-contained light fittings and emergency luminaires that can be powered by our central battery system. Besides central batteries, we also supply group battery systems to power emergency lighting in accordance with the relevant standards.

BE AHEAD OF YOUR TIME: WITH DURABLE AND VERSATILE LED TECHNOLOGY

A service life of at least 100,000 hours is just one reason behind the growing popularity of LED technology. LED light fittings are far superior to conventional light sources in terms of cost-efficiency and technology. And that's not all – LED light fittings are incredibly energy-efficient and require only minimal maintenance during operation. This means that they save time and money, while benefiting the environment through low CO_2 emissions.

What's more, our LED light fittings are extremely robust and vibration-resistant. At the same time, they have been designed to withstand extreme temperature conditions over the long term. Temperatures from -55 °C to +70 °C are not a problem for these premium products. This makes them perfect for use in harsh industrial environments.

Ultra-efficient light-emitting diodes provide exceptional luminous efficacy: With up to 180 lm/W, the LED is up to ten times more efficient than a halogen lamp. But our developments don't just focus on efficiency – it's also important for the colour rendering to be as exact as possible. We have ensured that our light fittings meet all of the requirements of EN 12464. All of the products have an Ra value of at least 80.

In addition to the colour rendering value, the colour temperature of white light is also significant. R. STAHL offers four colour temperatures to choose from. Alongside the standard version in neutral white with 5,000 K, there is a cool white with 6,500 K, a warm white variant with 4,000 K and a white with 2,700 K, which complies with the requirements of the International DarkSky Association (IDA). This means that we are ideally placed to meet the demands of different regions, industries and applications.

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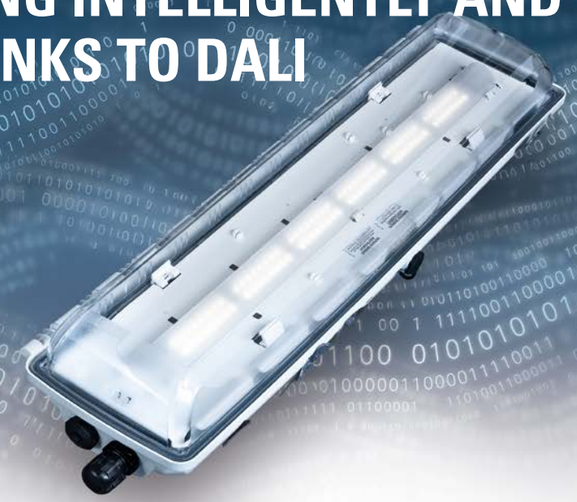
CONTROL LIGHTING INTELLIGENTLY AND EFFICIENTLY, THANKS TO DALI



Thanks to LED technology and digitalisation, central intelligent lighting control has finally become standard in modern building management – but there's still a way to go in hazardous areas.

By integrating DALI into our LED light fitting range, R. STAHL has taken the next step along this path and become one of the first manufacturers to offer modern lighting management in hazardous areas.

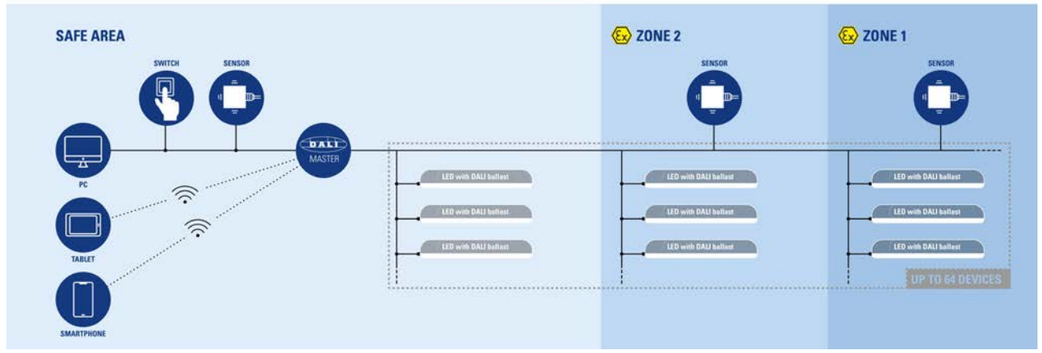
DALI stands for Digital Addressable Lighting Interface. This name captures the enormous potential of this technology in a nutshell – DALI enables individual lights and entire lighting systems to be digitally networked, switched, controlled and monitored. As well as adjusting light to suit a range of ambient, weather or working conditions, this technology allows users to centrally identify, log and manage upcoming maintenance work, the temperature of the lights and a range of other parameters.

To do so, a central DALI Master in an external location controls all the lights that have been assigned to it and are equipped with a DALI interface. At the same time, DALI is suitable for use as a digital interface to additional electronic operating units such as sensors and switches, the data from which is transmitted using a DALI bus.

- Compatible with all DALI-2 certified devices.
- Suitable for hazardous areas.
- Up to 64 DALI devices can be connected per master.
- Extremely safe.
- Significantly less costly and time-consuming thanks to longer service life.
- Less maintenance required.
- Comprehensive logging of lighting in hazardous areas.

DIGITAL LIGHT MANAGEMENT IN HAZARDOUS AREAS

Digital Addressable Lighting Interface



Compatible, established and future-proof

The DALI standard is used to safely control basic and standard functions. The current DALI-2 standard is compatible with a number of software solutions from other providers, as well as representing a globally established standard.

Of course, DALI devices are compatible with LED light fittings from R. STAHL. As a result, lighting in hazardous areas has become digital, automated, future-oriented and modern.

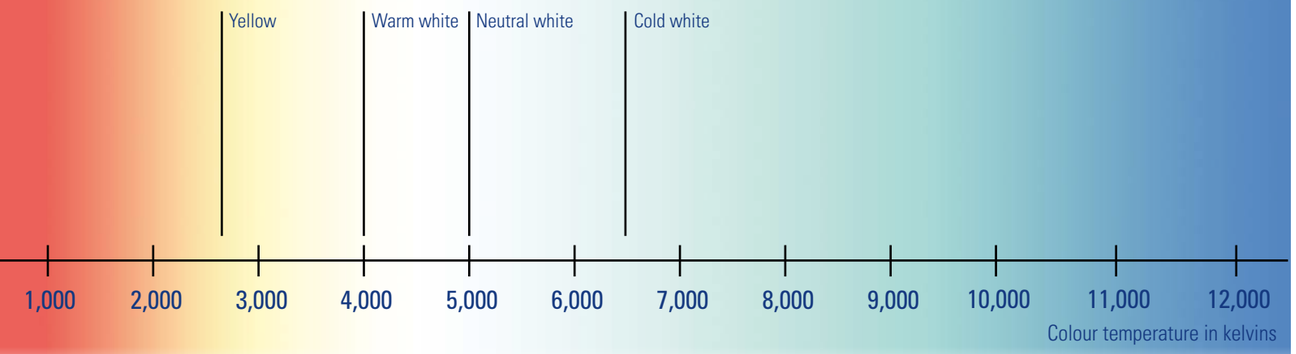
Intelligent networking

Benefit from customised and highly energy-efficient lighting management thanks to the various interface options.

Using LED lights and the new light and presence sensors from the 6080 series can reduce energy consumption by up to 70% compared to conventional lighting. Thanks to lighting based on requirements, the service life of light fittings is also extended.

- Constant light control via integrated light sensor.
- ATEX and IEC Ex approval for Zones 1, 2 and 21, 22.
- Range: radial – Ø 12 m; tangential – Ø 12 m.
- Coverage angle: 360°.

THE RIGHT COLOUR TEMPERATURE FOR EVERY APPLICATION



We are the only manufacturer on the market to offer our LED light fittings with neutral white light as standard and in alternative versions with warm white or cold white light colours.

No matter the colour temperature, all our light fittings achieve colour reproduction values above the threshold of CRI >80 specified in DIN EN 12464. As a result, they enable the use of standard-compliant lighting even in interior lighting systems. The various colour temperatures in our range are available as required for different applications and in different operating locations. This is essential to ensure that applications, for example surface coating, are performed and assessed correctly.

As well as these three colour temperatures, R. STAHL also offers special solutions for additional applications – yellow (extremely warm white) is ideal for environmental protection and animal conservation, for instance, as many animals are less attracted to this light.

Yellow light (colour temperature < 2,700 K) is also required in order to comply with the requirements of the IDA (International DarkSky Association). The stated goal here is to develop lights that produce absolutely no light emissions into the upper hemisphere, thereby reducing light pollution.

Yellow (from phosphor-converted to monochromatic yellow) is used for applications in pharmaceutical and photo laboratories.

- The higher the colour temperature, the colder the light seems.
- Colour reproduction values (R_a) and colour rendering index (CRI) for lamps range from 20 to 100.
- The higher the CRI value, the better the colour rendering.
- For indoor working areas, the CRI value should be >80.
- Corresponds to EN 12464 and IDA requirements.

Yellow (2,700 K): omits blue light components

Very warm white light is used in a number of ways: as an insect-friendly light colour for outdoor lighting, as an alternative to sodium vapour lamps, or as lighting in areas where no blue light is desired, such as the pharmaceutical and photo technology industries.

Warm white (4,000 K): warm, cosy yellow

Typically, warmer colour temperatures are used indoors than outdoors. Warm white light colours are used in Scandinavian countries as well as in the food industry.

Neutral white (5,000 K): friendly and realistic

The standard colour temperature offered by R. STAHL is 5,000 K. This colour temperature is universal and ideal for most regions and industries. This light colour is acceptable for use both indoors and outdoors.

Cold white (6,500 K): cool, stimulating blue

A cold white colour temperature makes it easier to detect small details or errors during quality inspections. Cold white light replicates natural daylight. This promotes concentration and is therefore ideal for work that requires high attention to detail.

EVERYTHING YOU NEED FOR FUTURE-PROOF LIGHTING

At R. STAHL, you will find light fittings for almost any application in explosion-protected areas:

- General lighting
- Pendant light fittings
- Floodlights
- Hand lamps
- Emergency luminaires

If you choose light fittings with explosion protection, you don't need to compromise on function: digitally controlled smart lighting, lighting based on requirements and application-specific light colours – anything is possible.

It goes without saying that we offer lighting solutions for non-explosion-protected areas, too. What are the benefits for you? You get a complete solution and the whole lighting system is from a single provider.

Do you have particular requirements? Get in touch with us and together we'll create the perfect lighting solution for you.

LINEAR LUMINAIRES

TUBULAR LIGHT FITTINGS

EMERGENCY LUMINAIRES

FLOODLIGHTS

PENDANT LIGHT

WALL- AND CEILING-MOUNTED FITTINGS

HAND LAMPS

MARINE LIGHTING

GENERAL LIGHTING AND EMERGENCY LIGHTING

Linear luminaire EXLUX series 6002/4

Address module DALI

6,950 lm +60 °C Zone 1/21
2,910 lm -40 °C Zone 2/22

The EXLUX 6002 can be fitted to the ceiling, a pole or it can be suspended. It is suited to general indoor and outdoor lighting applications, as well as indoor and outdoor emergency lighting. The new generation of the EXLUX 6002 continues to offer its reliable interchangeability, which is still an advantage in terms of form, fit and function when compared to series with conventional technology. In addition, it also features further glare reduction for improved safety in any plant.

- Luminaire efficacy up to 170 lm/W.
- Easily interchangeable up to the 5 ft version (1,650 mm).
- Robust and long-lasting LED technology "Made by R. STAHL".

Linear luminaire EXLUX series 6402/4

Address module DALI

The universally usable light fittings from the EXLUX 6402/4 series offer higher luminaire efficacy and achieve outstanding values of up to 170 lm/W. Their low power consumption and significantly reduced glare offer even more user benefits.

- 1:1 interchangeability with conventional technology – even for 2 x 58 W version.
- Long-lasting, robust technology, low glare and high colour rendering for optimum working conditions.
- Quick and easy to install, with installation accessories.
- Lightweight yet robust, with an impact strength of IK10.
- With long-lasting, efficient LED technology (up to 170 lm/W).

6,950 lm +60 °C Zone 21
2,910 lm -40 °C Zone 2/22

Linear luminaire EXLUX series L402/4

Address module DALI

6,950 lm +60 °C
2,910 lm -40 °C

R. STAHL also offers industrial solutions for high-quality lighting of industrial facilities beyond explosion protection. With proven mechanical robustness and high electrical and photometric efficiency for a cost-efficient lighting solution.

- Extremely robust industrial luminaire with IK10 and IP66/67 performance.
- High photometric efficiency of up to 170 lm/W with the lowest glare.
- Thanks to long-life LED technology, even at high ambient temperatures, the luminaire offers low costs over the entire life cycle.

Emergency luminaire EXLUX Series 6009/4

DALI

5,810 lm +60 °C Zone 1/21
2,910 lm -30 °C Zone 2/22

The new generation of the EXLUX 6009/4 emergency luminaire guarantees improved safety in any system. As well as the series' reliable interchangeability in form, fit and function, when compared to the EXLUX series with conventional technology, it also features further glare reduction.

- Luminaire efficacy up to 160 lm/W.
- Easily interchangeable up to the 4 ft (1,467 mm) version.
- Robust and long-lasting LED technology "Made by R. STAHL".
- Automatic test functions for the weekly test and annual rated duration test.

Emergency luminaire EXLUX Series 6409/4

DALI

For a well-balanced lighting system, the EXLUX 6409/4 has also been upgraded to the latest technology: maximum efficiency and low glare with maximum safety thanks to built-in test functions in accordance with the standard.

- Automatic test functions for the weekly test and annual rated duration test.
- Maximum energy savings to protect the environment.
- Long service life for sustainable lighting solutions in explosion protection.

5,810 lm +60 °C Zone 21
2,910 lm -30 °C Zone 2/22

Emergency luminaire EXLUX Series L409/4

DALI

5,810 lm +60 °C
2,910 lm -30 °C

This light fitting which meets very high standards, especially those which apply to explosion-protected self-contained emergency luminaires, is now also available for industrial use. Alongside the mechanical robustness and durability of the light fitting, all tests for emergency luminaires required by standards are automatically available.

- Weekly test, annual battery functionality and emergency operability test are automatically available.
- Test results are displayed or communicated via DALI.
- DALI makes simple mixed operation with the general lighting and central function monitoring possible.

ACCESSORIES FOR EXLUX SERIES LIGHT FITTINGS

Whether mounting accessories, covers or auxiliary kits for greater safety – our accessories complete our range of EXLUX light fittings to meet your specific requirements.

MOUNTING ACCESSORIES	Mounting rail	Standard mounting bracket or ceiling mounting optionally with internal metal rail Material: stainless steel
	Mounting bracket	Mounting rail for mounting on any metal structure Material: stainless steel
	Pipe mount	Mounting rail for mounting on the pipe for the following sizes: 1 1/4" (D = 30 mm) 1 1/2" (D = 40 mm) 2" (D = 50 mm) Material: stainless steel
	Bracket for wall mounting	Assembly kit for wall mounting, adjustable Material: stainless steel
	Adaptor for pole mounting	Kit for pole mounting, pole diameter 40 mm Material: stainless steel
COVER	Replacement translucent cover	Available with lens or sand-blasted for the following sizes: Size 2/2 ft Size 4/4 ft Size 6/5 ft
	Replacement translucent cover for escape sign	Available for size 2/2 ft with different versions: Upward arrow Downward arrow Right arrow Left arrow
OTHER	Fall down protection kit	Auxiliary kit with arrester cable
	Holder for translucent cover	Auxiliary kit for the translucent cover with lens
	Reflector lock	Auxiliary kit to prevent unauthorised opening
	IP20 protection	Auxiliary kit to protect against contact with electrical surfaces
	Breather	Available sizes: M20 or M25 Material: plastic or stainless steel
HIGHLIGHT	Reflector plate	The reflector plate makes it possible to quickly and easily change from conventional lighting to LED. There is a kit to go with each of our EXLUX Series light fittings. If you have already made the switch to LED, you can upgrade your light fittings in line with the latest technical standards with these kits. No matter which option you choose when it comes to the colour, DALI or address module, it doesn't matter – ANYTHING is possible.

LED TUBULAR LIGHT FITTING

Tubular light fitting series 6036/3 | **Address module** | **DALI**

6,040 lm | +70 °C | Zone 1/21

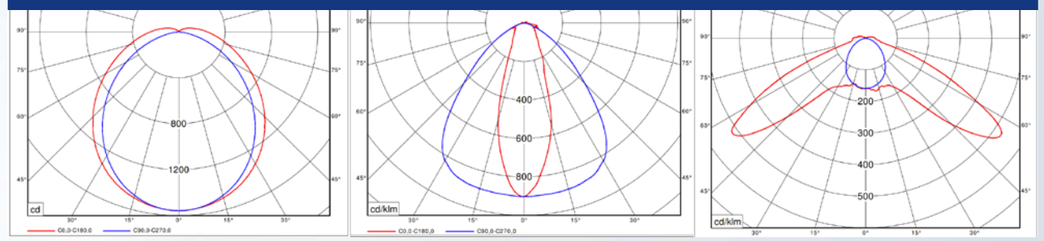
1,260 lm | -55 °C | Zone 2/22

The compact LED tubular light fitting series 6036/3 was developed for extreme conditions. It is equipped with state-of-the-art features. The result: a robust luminaire with low energy consumption and an exceptionally long service life. Perfect for any industry with the highest safety requirements.

- IP66/IP67, IP68 rating.
- Resistant to vibration, lightweight, robust (impact strength of IK10) and maintenance-free.
- Intelligent control possible thanks to optional DALI interface.

WITH LIGHT DISTRIBUTIONS SUITABLE FOR EVERY LIGHTING SITUATION:

Wide-beam spotlight | Narrow-beam spotlight | Batwing



WITH THE R. STAHL COLOUR SCHEME:

DarkSky	Warm white	Neutral white	Cold white
2,700 K	4,000 K	5,000 K	6,500 K

AND IT CAN ALSO COLOUR:

Yellow (mc or pc)* | Blue | Green | Red

* mc – monochrome
pc – phosphor-converted

COMPACT LIGHT FITTINGS

Compact light fittings series 6102 — Address module — DALI

775 lm | +60 °C | Zone 1/21
490 lm | -40 °C | Zone 2/22

The 6102 LED light fitting is optimised as an escape route sign luminaire as per ISO 7010. This light fitting is available in a basic version, a DALI version, and a version with an address module for operation on central battery systems. Without the symbol display panel, the luminaire can also be used as a compact light fitting for illuminating specific areas, escape routes or danger zones.

- Can be used universally for indoor and outdoor applications.
- Versatile: can be used to display the different signs and symbols in accordance with ISO 7010.
- When equipped with secondary optics, suitable for use as a compact light fitting.

Compact light fittings series 6109 — DALI

The 6109 LED light fitting represents an optimised LED solution for escape route signage and escape route lighting. The hanging sign means that the light fitting does not need to be installed in as many locations, as it can be read from both sides. As well as the standard version with an integrated battery, versions with DALI are also available.

- Single-supply escape route sign luminaire as per DIN EN 60598-2-22 with escape route sign as per ISO 7010.
- Integrated, automatic-start test functions for weekly test (functional test) and annual test (battery time test).
- Secondary optics for optimised escape route lighting and/or door area illumination.

775 lm | +60 °C | Zone 1/21
490 lm | -30 °C | Zone 2/22

C-LUX compact light fittings — DALI

Whether as emergency lighting, lighting to provide information or illuminate walkways, or as escape route lighting, you can use the robust and lightweight C-LUX compact light fittings for many different applications. Simply choose your safety/warning sign from the standardised pictograms (ISO 7010) and colours (ISO 3864-4) and we will custom-produce it for you.

Warning	Signal yellow
Prohibition/fire safety	Signal red
Mandatory	Signal blue
Rescue/escape	Signal green
Edge/symbol/supplementary	Signal white
Symbol	Signal black

PENDANT LIGHT FITTINGS

Pendant light fittings series 6050/6

The 6050/6 series multipurpose luminaire is the most reliable and flexible lighting solution owing to the innovative LED technology used. It can be used as a classic ceiling light fitting, pendant light fitting or a small floodlight – along with the wide range of mounting accessories and light distribution curves available. Thanks to the optionally available satin-finished lens, you can use the luminaire as a glare-free ceiling light fitting at low mounting height. With the range of various performance classes and the very high efficiency in terms of lighting technology, the luminaire provides the opportunity to replace conventional spotlights smoothly with a power output up to 500 W.

The wide-beam light distribution prevents light pollution and ensures the optimum use of the radiated light on the usable surface. Moreover, the design of the luminaire enables use in a high-stress environment. The IP68 degree of protection and the seawater-resistant aluminium make the luminaire ideal for installation offshore and on ships. The ambient temperature from -55 °C up to +70 °C allows the lighting of areas which have a high thermal load due to the relevant process.

- Universal light fitting is a flexible solution, thanks to the range of power output classes available: 20 W, 40 W, 60 W, 80 W.
- Low-maintenance plus long service life owing to innovative chip-on-board LED technology.
- Can be installed directly on the ceiling, using ring eyes, pipe clamps or a pivoting mounting bracket.

FLOODLIGHTS

Floodlight series 6125/2 — DALI

This floodlight is ideal for lighting large areas from elevated positions. Three different light distribution types offer added versatility to fulfil your lighting needs. With up to 24,500 lm, the LED floodlight offers a very high luminous flux and, thanks to the highly efficient optics, can achieve luminous intensities that exceed the values of high-intensity discharge lamps.

- Low-maintenance due to long service life of up to 100,000 operating hours.
- Versatile thanks to the three different light distribution curves.
- The V4A (SS316L) stainless steel housing makes it ideal for marine and offshore applications.

Floodlight series 6525/2 — DALI

The 6525 series LED floodlight is ideal for lighting up large areas from elevated positions. Its wide-beam light distribution makes it an excellent choice as a spotlight for lighting industrial buildings or as a high-bay light fitting; it can also be installed in relatively inaccessible places. The floodlight is generally designed with an enclosure and a bracket made from single-coated sheet steel. Thanks to the digital interface with DALI-2 protocol, the floodlight can also be controlled and monitored from a central control room.

- Can be used in Zone 21 and Zone 2/22.
- Low-maintenance due to long service life of up to 100,000 operating hours.
- Can be controlled and monitored remotely thanks to DALI-2 interface.

HAND AND HEAD LAMPS

Inspection light series 6149

The 6149 series inspection light is a flexible solution that provides lighting exactly where you need it. The innovative design of the enclosure makes the light extremely slim and lightweight. Its lockable suspension hooks and practical anti-roll protection make it ideal for use in the workshop.

- Long-life, energy-saving, high-performance LEDs designed using innovative technology.
- Standard version with diffuser to limit glare.
- For 110–240 V AC/DC, 24–48 V AC/DC, or 12 V DC.

Portable floodlight series 6148

The ergonomic design of the 6148 series portable LED lamp allows you to operate this lamp with just one hand. Its brightness can be freely adjusted; alternatively, it can be set to flashing mode. The pivoting lamp head allows you to direct the light cone virtually anywhere. Coloured diffusing lenses are available as accessories, and transform your lamp into a portable Ex signal beacon. When connected to the charging unit, it has an emergency lighting function.

- Incredibly lightweight.
- Long battery runtime.
- Approved in accordance with the firefighting standard.

Portable floodlight series L148

The L148 LED portable lamp can be infinitely adjusted and can be switched to flashing mode if required for use as a beacon. Colour diffusers are also available as accessories for this purpose. The portable lamp is approved for use in vehicles.

- Lamp head can be pivoted 190°.
- Main light can be dimmed to any level.
- Ergonomic one-handed operation even when wearing gloves.

Hand lamp 6141/61-1S

Thanks to its certified explosion protection, this light fitting is ideal for extreme working and operating conditions. The slim housing of the hand lamp is made of non-conductive polycarbonate, a robust material which is completely water-tight and dust-tight. There is a rubber-coated button at the rear of the light fitting so that it can be easily used with just one hand.

- Hand lamp with ATEX and IECEx certification for Zone 1/21.
- Light fitting width: approx. 35 m.
- Clip for mounting.

Hand lamp 6141/12-2S

The 6141/12-2S LED hand lamp is designed specifically for use in difficult environments and is one of the most reliable and powerful lighting options in our range. It is completely water-tight, boasts a robust, rubber-coated lamp head with explosion protection, and is perfectly shaped to fit in your hand.

- Hand lamp with ATEX and IECEx certification for Zone 0/21.
- Rubber-coated rear switch for one-handed operation.
- Up to 15 hours of reliable brightness.

Head lamp 6141/64-1S

The 6141/64-1S safety head torch is the perfect light source if you need to keep your hands free. It is dust-tight, watertight and, thanks to its lightweight polycarbonate housing, weighs just 130 g. The head torch is certified for use in Zone 1/21, offers visibility of up to 150 metres and an operating period of up to 12 hours.

- Head torch with ATEX and IECEx certification for Zone 1/21.
- Adjustable rubber and neoprene band.
- Rubber-coated lamp head with adjustable radiation angle.

MARINE LIGHTING

Navigation lights

Navigation lights are critical to aid navigation and prevent accidents at sea. Tranberg is one of the leading suppliers of navigation light solutions and offers a wide range of navigation light and control panels for vessels from 12 to 50 metres.

Searchlights

Searchlights have been a key product for decades. Tranberg offers a range of searchlights, from manual operated to more sophisticated solutions with remote control and operations.

With a proven technology and sturdy design, our searchlights have been a sign of quality and safety for years.

Floodlights

Tranberg offers a range of floodlights designed and manufactured for marine applications.
TEF2581 with 5,000 lm and 10,000 lm light output is the latest addition to the range.

Deck lighting

TRANBERG® TEF2760 is a high-quality LED luminaire designed and manufactured for harsh marine environments. A waterproof linear luminaire for various applications such as gangways, open decks, engine rooms, storage areas, etc. It is available in a powder-coated AIS316L deep-drawn stainless steel housing for outdoor installations or in a galvanised steel housing for indoor applications. A variety of brackets are available for alternative mounting options.

IMPORTANT FACTORS FOR WORKPLACE LIGHTING

EN 12464 governs lighting in the workplace. It describes the illuminance levels required for specific tasks and workplaces. This standard also defines minimum values for uniformity, colour rendering and glare. However, it does not describe how to achieve these values. The standard also fails to explain some functional requirements for lighting.

In principle, what matters is a minimum illuminance to be achieved at ground level. Since every light fitting you add results in additional maintenance requirements for the user, the lowest possible number of light fittings should be used. So the best option would be to use just a single light fitting to create sufficient luminous flux in a system to be illuminated.

However, this would cause major problems for the system operator and for the employees working in this environment.

FOR EMPLOYEES

Using just one light fitting to illuminate the whole area inevitably causes shadows cast by employees. If there is any doubt, it might not even be possible to perform the activity correctly if the member of staff has to bend over the work area, for example. What's more, having the workplace illuminated just from above with a single light would only provide horizontal illumination. There would be no vertical lighting or cylindrical lighting, which is responsible for illuminating vertical surfaces. As a result, facial recognition wouldn't work either, and it wouldn't be possible to visually perceive depth when looking towards the horizon.

FOR OPERATORS

In order to light the workplace as uniformly as possible – uniformity is a requirement laid down in EN 12464 – this spotlight must be attached to a very high mounting point. But this installation method would result in very high maintenance costs for the operator in the event of failure or during regular maintenance. What's more, there is no redundancy which would ensure that the workplace remains illuminated if this single light fitting were to fail.

So it's always important to design the best possible lighting solution for each system's particular requirements. The possible installation points for the lighting fixtures, the surfaces to be illuminated and the expected position of the people working in the system must be taken into consideration. This means that the tasks are relevant to the design of the lighting system. Environmental protection and animal conservation aspects also have to be taken into consideration when planning lighting systems for use outdoors.

It is important to prevent "up-light", i.e. light emissions above the light fitting, for energy efficiency reasons and to protect wildlife.

In addition, the average age of the working population is increasing, bringing along with it deteriorating vision due to ageing. This is why a higher illuminance must be planned in order to ensure that staff can carry out their work correctly. To do so, the lighting calculations need to be adjusted accordingly, and customer requirements taken into consideration.

Animal conservation through reducing the amount of blue light in LED lights

The use of artificial light, especially LED light fittings, offers many advantages compared to conventional technology: in addition to the longer service life and greater efficiency, LED lighting is easier to control and adjust, which opens up many new possibilities.

Fluorescent lamp technology was limited to a few different colour temperatures due to the way in which light was produced. Compared to this, LED technology allows for much more nuance and also spectral distributions. But there is increasing focus on the short-wavelength range, known as blue light, because these spectral components attract many animal species. The human eye is most sensitive to light in the middle of the wavelength range of visible light, in the green spectral range. In contrast, most animal species see in the very short-wavelength range, the blue spectral range.

Since LED technology is based on a blue LED in order to give off white light, every LED which produces white light also always emits a significant amount of blue light. This makes every LED light source or light fitting based on LED light sources a magnet for many insects. This should be avoided, as the true function of artificial light is to illuminate workplaces for employees.

Nowadays it's possible to minimise the amount of blue light emitted by an LED. This is done by maximising the absorption of blue light in the conversion substance, which generates the long-wavelength components of the LED emission. The LED then emits white light with a very low colour temperature value of less than 3,000 K. This colour temperature complies with the recommendation issued by the International DarkSky Association (IDA). It goes without saying that this option is a fixed part of the product range for all R. STAHL light fittings.

EMERGENCY LIGHTING TECHNOLOGY

Central battery systems series 6950

The lighting of workplaces in enclosed spaces requires standard-compliant emergency lighting. The most convenient solution for you is a central battery system (CBS). The R. STAHL 6950 series central battery system is designed to supply emergency lighting and emergency luminaires in explosion-protected areas. The CBS and the battery cabinet are located in the safe area. This simplifies installation, programming, operation and maintenance. With a central computer integrated into the CBS, up to 63 subgroup control CBSs can be interconnected and networked. Each individual sub-assembly can control and monitor up to 60 final circuits with over 600 light points.
The connected emergency and escape sign luminaires are either current-monitored or can optionally be individually addressed. In the case of individually addressed luminaires, communication takes place between the luminaires and the CBS via the supply cable, which means no additional cabling is required. The CBS takes over the energy distribution and supplies the connected luminaires with mains voltage and, in the event of a mains failure, with battery voltage. It automatically carries out the standardised functional tests and saves the results in an electronic test log. Any error messages can be sent automatically by email to a distribution list. The CBS can also be connected to company networks via optional add-on modules and connected to centralised maintenance systems.

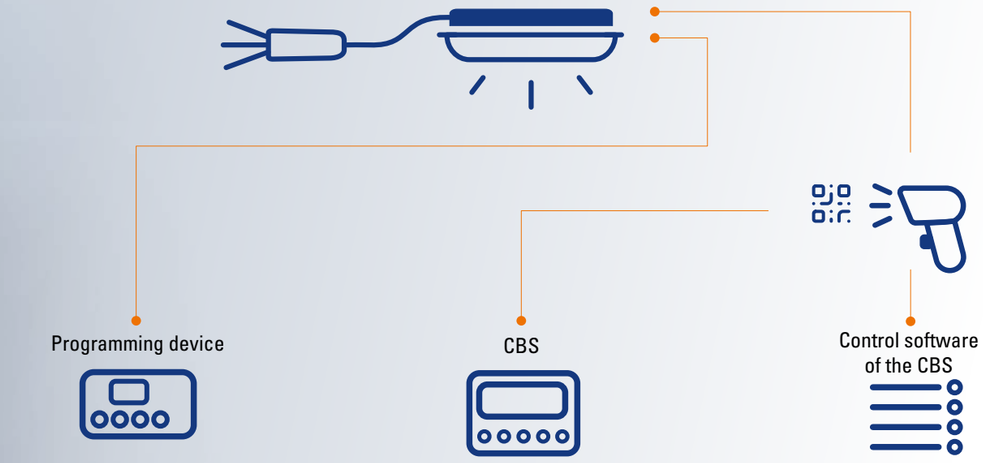
- You can connect lights from the 6002/4, 6402/4, L402/4, 6036/3 and 6102 product ranges to the CBS.
- The luminaires can be controlled and monitored via the luminaire circuits. If you opt for the optional address module, you can even control each luminaire individually.
- You can choose between “Permanent on”, “Stand-by” or “Mixed mode” as the operating mode and programme various scenes.
- You can use additional modules to extend the functionality of the CBS and also connect it to other systems. Remote access or emergency light blocking are possible.
- The maintenance-free rechargeable batteries have a minimum service life of ten years.

Group battery system

The compact, freely programmable, microprocessor-controlled group battery system defined in accordance with DIN VDE 0108-100 is suitable for individual and group monitoring of lighting within individual fire compartments.

- Can be configured to run for one or three hours.
- Emergency and escape sign luminaires are tested automatically.
- The result is recorded in the electronic log.

Address module



Programming

All R. STAHL emergency and safety light fittings are optionally available with an integrated address module. The address module ensures that communication and monitoring can take place via the central battery system. The luminaire then reports its operating status and maintenance status to the central battery system (CBS). This is stored and documented in the electronic inspection logbook. In addition, the CBS transmits the desired operating mode – “Stand-by”, “Permanently on” or “Mixed mode” – to the electronics of the luminaire.

The address is entered together with the programming of the safety light fitting either via an external computer, via an optionally available programming device or via the CBS itself.

- The address module is integrated into the operating electronics of the LED luminaire.
- The luminaire is connected exclusively via the supply cable. No additional data lines are required.
- The address modules in the luminaires are programmed completely contact-free and electronically.

LED LIGHT FITTINGS FOR ALL YOUR REQUIREMENTS

R. STAHL is continually striving to develop sophisticated LED light fittings for all industry sectors and hazardous areas. Increasingly, the focus is on special production and application conditions that require lighting solutions with a modified colour spectrum. These include, for example, fields of application in the pharmaceutical industry and photographic development, where a high fraction of blue light can be detrimental to the quality of the products. We have developed LED light fittings that minimise the blue fraction by selectively converting the emission spectrum. LED solutions are twice as efficient as filtered fluorescent lamps.

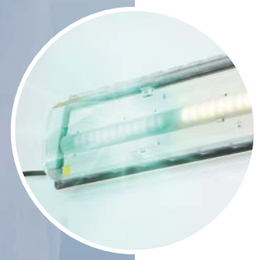
We also offer special light fittings for identifying specific devices in industrial plants. For example, emergency safety showers and eyewash stations are identified by means of a green light, while fire extinguishers are identified by means of a blue light.

R. STAHL also allows you to create custom signage or information displays for use in your facilities using “light fields”. This enables you, for example, to signal processes and display process statuses. These light fields can optionally be designed to effectively ”disappear”, meaning that they will only be noticeable when they are switched on.

While working on developing our LED light fittings, we also take into consideration the environmental impact of the lighting. In outdoor facilities in particular, the light often shines into unused areas in which it is important that the natural behaviour of the animal and plant kingdoms should not be affected. Furthermore, R. STAHL ensures minimal light is discharged into the environment in order to avoid light pollution. Hence R. STAHL takes care to ensure that the light distribution of the light fittings has only a minimal luminous flux in the upper hemisphere.

INNOVATIVE LED LIGHT FITTINGS PROTECT BOTH ANIMALS AND THE ENVIRONMENT

R. STAHL supplies LED light fittings specially designed for outdoor usage – developed with a view to ensure that they have a minimum impact on our natural environment. To not affect the natural behaviour of turtles, yellow lighting is used, for instance.



SPECIAL LIGHTING THAT SHOWS YOU TO SAFETY

To ensure that help is at hand as quickly as possible in an emergency, people need a visual indicator that shows them clearly where to go. This is why we have included in our portfolio extra LED light fittings, which use designated colours to indicate the presence of different safety equipment.

LIGHT FITTINGS DISPLAYING SPECIFIC WARNINGS

Individual printed warnings allow important information to be conveyed within the facility. And because the light fittings are connected to a central battery system, you are 100% safe even in the event of a malfunction. The text information can only be read when the light is switched on.

PLANNING FRAMEWORK FOR LIGHTING SYSTEMS – CUSTOMISED AND COST-EFFECTIVE

Is it possible to plan "light"? It's not just possible – it's essential! Especially when it comes to illuminating hazardous areas. What's more, the installation or conversion of lighting systems often involves several thousand light fittings, which is why planning mistakes can quickly become costly. We would be happy to draw up the planning framework for your lighting task. As a result, you receive:

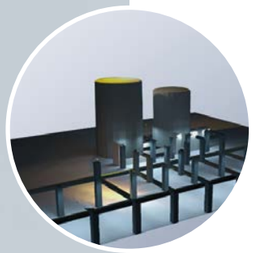
- The total requirements for light fittings, taking the optimal installation position and alignment into consideration.
- Information on illuminance (min., max., average) in normal and emergency lighting operation.
- Information on the uniformity of the lighting.
- Information on escape route lighting.

We give you our recommendations as a PDF document. We are also happy to show you the 3D renderings of our planning software if requested. It goes without saying that the planning framework for lighting systems takes occupational health and safety, and safety in general, into consideration. This also gives rise to requirements for electrical installation planning.

On request, we can perform an initial measurement of the illuminance at your premises, which we will base our recommendations on. We also define the operating conditions and maintenance cycles together with you, making it possible to calculate the total costs. And to give you peace of mind, we can also help you with commissioning and maintenance.

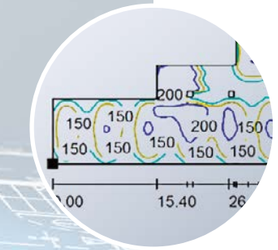
Would you still like to plan your own lighting system? This is possible with our DIALux offline plug-in, for example, which can be used to import our light fittings directly into the DIALux software. We also offer LDT, ILS and ULD files for our light fittings to download on our homepage. You can use these for lighting calculations in all software solutions.

All product information at r-stahl.com/luminaires



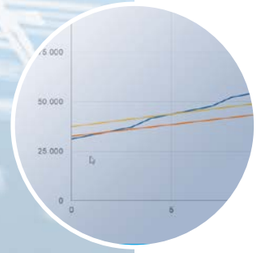
DALI PLANNING FRAMEWORK

There is a vast array of options, especially for customised, digital solutions. We help you to keep an overview and choose the right components – depending on the size of the system and the required functions. We can provide you with a ready-to-connect system solution if you'd like.



DALI PROGRAMMING

We help you choose your digital light management system and, if requested, program the system at your premises according to your specifications.



CBS ENGINEERING

We create a CBS depending on the size of the system and according to your needs and supply a ready-to-connect system.

MAINTENANCE AND DOCUMENTATION

After installation, we will be happy to help you optimise your lighting system. We can perform further measurements for you on request. This way, you can document that the lighting system and emergency lighting are working properly.

FIND MORE INFORMATION ABOUT R. STAHL'S LIGHTING SOLUTIONS HERE:

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STAHL

R. STAHL

Am Bahnhof 30
74638 Waldenburg, Germany
T +49 7942 943-0
F +49 7942 943-4333
r-stahl.com

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