Airfield Lighting

Manual

Omnidirectional Elevated Light (F2.1)

- F.A.T.O: Final Approach and Take Off area
- T.L.O.F: Touchdown and Lift Off area
- Heliport Approach
- Taxiway Edge
- Apron Edge

THORN Airfield Lighting IDMAN

SAFEGATE GROUP

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MANUAL
OMNIDIRECTIONAL ELEVATED LIGHT
(F2.1)
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Documentation

This document includes Airfield Lighting information with a focus on safety, installation and maintenance procedures.

***Note**: It is very important to read this document before any work is started.*

Original documentation is created in English (U.K.).

Images and texts used in this document are reference examples only and may not exactly depict a customer product.

For more information, see www.safegate.com.

Copyright

History

Version	Date	Description
1.0	November 2010	First Release
1.1	October 2011	Second Release
1.2	December 2011	Third Release
1.3	March 2014	Fourth Release

***Note**: This page is to be updated with every authorised change to the document.*

Abbreviations and Terms

This document may include abbreviations and terms.

Abbreviation	Term
APP	Approach
CAA	Civil Aviation Authority
CU	Concentrator Unit
FAA	Federal Aviation Administration
HEL	Heliport
ICAO	International Civil Aviation Organization
IEC	International Electrotechnical Committee
LMS	Light Monitor and Switch unit
NATO	North Atlantic Treaty Organization
STAC	Service Technique de l'Aviation Civile (France)
STANAG	Standardization Agreement (NATO)

1. INTRODUCTION

In this section you can find a general description and safety instructions related to the installation and usage of the fitting.

F2.1 is an omnidirectional elevated light.

The fitting has many advantages and special features:

- Low power consumption.
- Power supply: 230 Vac 50/60 Hz.
- Lifetime higher than 2,000 hours for halogen lamps.
- Frangible support.
- Easy and fast lamp replacement.
- Power Supply Cable protected by running through the support.
- Simple but sturdy design.
- Light weight: less than 1.5 kg with the lamp.
- The fittings installed on frangible holding tubes can be equipped in option with a day marking cone.

1.1 SAFETY INSTRUCTIONS

Make sure you read this section and are familiar with safety precautions before any work is started.

1.1.1 Product Safety

Airfield lighting fixtures in a constant current circuits are connected in a circuit via isolating transformers with currents between 2.0 – 6.6A in the primary circuits.. The primary voltages, depending on the circuitry, are usually several kilovolts and therefore lethal. Although the open circuit voltages of the isolating transformers are much lower, the peak voltage while opening the secondary circuit under current is also hazardous. So it is vitally important to follow all the safety regulations with adequate circumspection.

In the design of this equipment all the practical safety aspects have been taken into account. It is also important to strictly follow existing international or national regulations, the instructions established by civil aviation authority or airport operator and the following instructions.

1.1.2 Electrical Maintenance

Valid safety regulations must always be followed. Never carry out any maintenance or maintenance measures before the current is confirmed as safely disconnected. Use extreme caution when disconnecting or connecting high voltage primary connectors.

WARNING! *PRIOR TO THE COMMENCEMENT OF WORK ALL ELECTRICAL SERVICES MUST BE ISOLATED FROM THE SUPPLY AND CONNECTED TO EARTH. FULL DETAILS OF THE WORK INVOLVED MUST BE GIVEN TO THE AUTHORISED PERSON RESPONSIBLE FOR THE ELECTRICAL ENGINEERING SERVICES AT THE AIRPORT WITH REGARD TO THE DURATION OF THE WORK AND SO ON. IT IS RECOMMENDED THAT PRIOR TO STARTING ANY CUTTING WORK, THE NATURE AND LOCATION OF SERVICES SUCH AS CABLE DUCTS AND THE LIKE SHOULD BE IDENTIFIED. ANY INSTALLATION OR MAINTENANCE WORK SHOULD ONLY BE CARRIED OUT BY TRAINED AND EXPERIENCED PERSONNEL. ALSO, WHEN WORKING ON CIRCUITS USING AIRFIELD SMART*

POWER SYSTEM (ASP) THE SCM MUST BE TUNED OFF.

1.1.3 Mechanical Maintenance

When maintaining mechanical components, it is important to follow the instructions for electrical maintenance.

1.2 DESCRIPTION OF THE FITTING

The F2.1 light fitting is an omnidirectional elevated fitting equipped with one E27 lamp. This fitting is used mainly for lighting of Heliport:

- F.A.T.O (White / 105 W E27).
- T.L.O.F (Green / 70 W E27).
- Taxiway edge (Blue / 53 W E27).
- Apron edge (Blue / 53 W E27).

1.3 DELIVERY OF THE FITTING

Each light fitting includes four sub-assemblies:

1. One F2-1 Optical Glass with Fresnel Prism.
2. One lamp.
3. One F2-1 Mounting (lamp and optical glass holder) with gasket.
4. One device for ground fixing.

Each sub-assembly is delivered in a separate package (by unit or by batch) in a durable cardboard box, labelled with reference names and codes. On request, a documentation set (including: manual, product description and spare parts list) can be delivered with the fitting.

2. INSTALLATION

In this section you can find a description of the different steps for successful installation of the fitting. Before you start, make sure you have read and understand §1.1 Safety Instructions.

When removing the fitting from its packaging box, check that nothing is broken.

The screw tapping of the frangible support can be either 2 in. NPS (American standard - 11.5 threads per inch) or 2 in. BPS (British standard - 11 threads per inch). Check support and base tapings fit.

The following tools and accessories are required for installation and removal of the unit:

Standard tools and accessories:

- One 22 mm open end wrench
- One cutting pliers
- One wire stripper
- One cutter
- One medium screwdriver
- One brush or cloth
- Two Phillips screwdrivers: PH1 and PH2

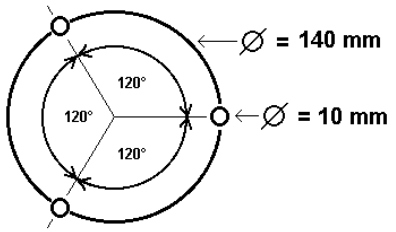
The installation steps refer to:

1. Installing the fixing rods for tripod stand
2. Installing the fitting on tripod stand using frangible holding tube
3. Installing the fitting on tripod stand using breakable coupling
4. Electrical cabling
5. Mounting the lamp
6. Mounting the optical glass

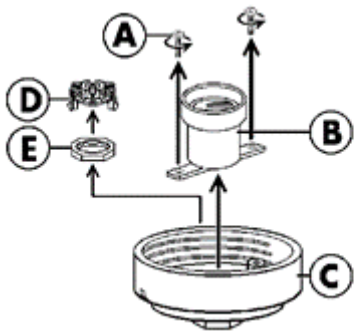
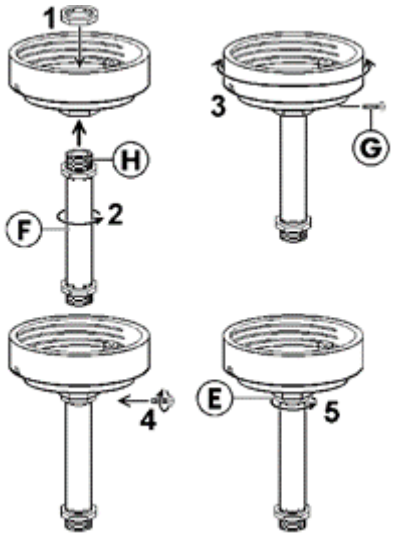
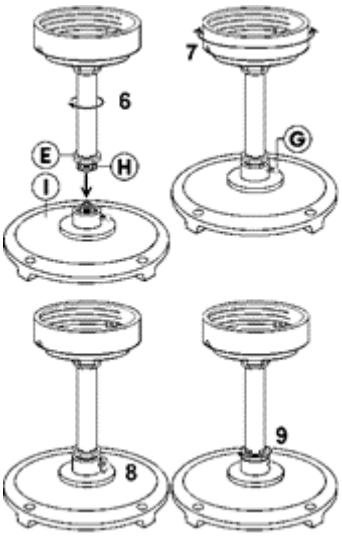
2.1 INSTALLING THE FIXING RODS FOR TRIPOD STAND

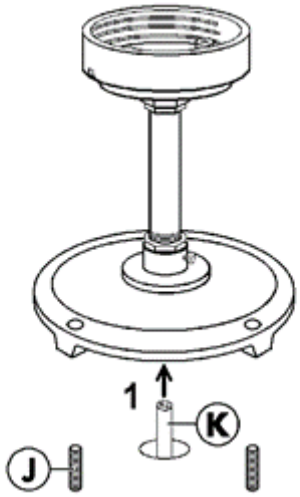
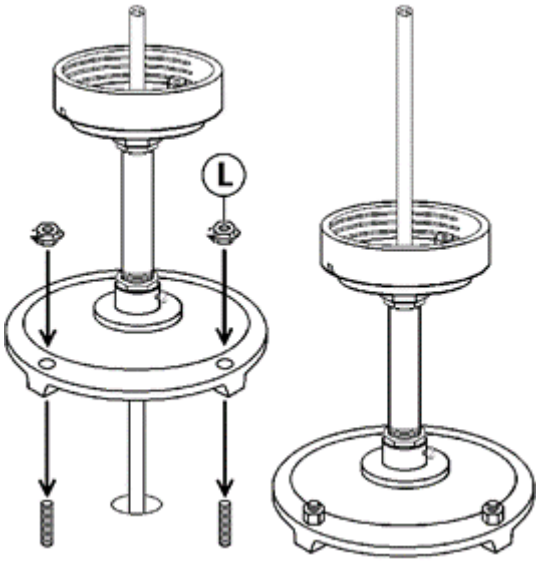
The first step of all types of installation consists of fixing the three threaded rods (sealing rods or anchor studs) in the ground.

The dimensions given here allow installation of rods compatible with the tripod stand.

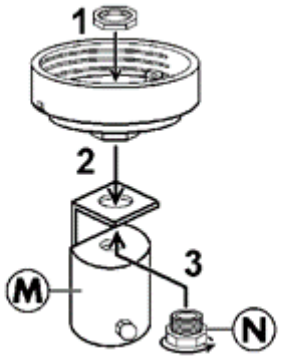
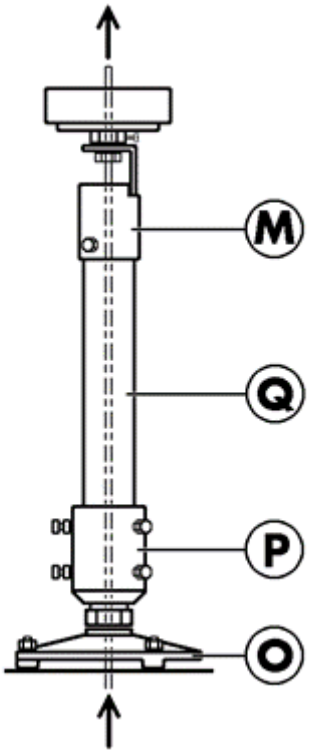


2.2 INSTALLING THE FITTING ON TRIPOD STAND - FRANGIBLE HOLDING TUBE

Remove the lamp holder	
(a) Unfasten and remove the two lamp holder fixing screws (A). (b) Remove the lamp holder (B) from the F2.1 mounting (C).	
Mount the fitting body	
(a) Make sure the fixing nut (E) and the class 2 protection cap (D) are in place. (b) Attach the frangible tube (F) to the F2.1 mounting and fasten the fixing nut. (c) Twist the mounting on the tube to place the frangible tube fixing screw (G) in front of the saw cut (H) of the frangible tube. (d) Fasten the frangible tube fixing screw. (e) Fasten and lock the locking nut (E).	
(f) Fasten the assembly F2.1 mounting / frangible tube on to the F2.1 tripod stand (**I**). (g) Turn the assembly mounting F2.1 / frangible tube in order to place the frangible tube fixing screw (**G**) in front of the saw cut (**H**) of the frangible tube. (h) Fasten the frangible tube fixing screw. (i) Fasten and lock the locking screw (**E**) of the frangible tube.	

Ground fixation	
(a) Hold the F2.1 body over the threaded rods dedicated to fix it (J). (b) Pass the power supply cable through the fitting leg (K). ***Note:*** *It is recommended to add an extra length of 1 m for easy connection of the fitting during electrical cable installation. For more information, see the next section*.	
(c) Mount the F2.1 body on the three threaded rods. (d) Screw and lock the three fixing nuts (L).	

2.3 INSTALLATION ON TRIPOD STAND - BREAKABLE COUPLING AND 60 MM TUBE

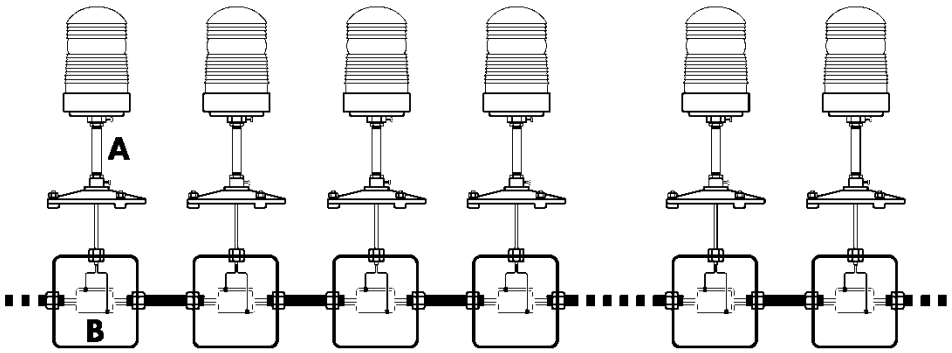
Mount on the adapter for 60 mm tube	
(a) Remove the lamp holder . (b) Place the fixing nut (E) and the class 2 protection cap (D) in position. (c) Put the F2.1 mounting on the adapter for 60 mm tube (M). (d) Fix the mounting on the adapter using the adapter fixing screw (N) and the fixing nut of the F2.1 mounting.	
Mount the fitting	
(a) Fasten and lock the frangible coupling (P) on the tripod stand (O). (b) Mount and fix the 60 mm tube (Q) in the frangible coupling. (c) Fix the assembled F2.1 mounting/ adapter (M) on the 60 mm tube. (d) Pass the power supply cable through the tripod stand, the frangible coupling, the tube, the adapter and the F2.1 mounting. (e) Mount the tripod on the three threaded rods, fasten and lock the three fixing nuts. (f) Adjust the 60mm tube and fix it vertically. ***Note:*** *It is recommended to add an extra length of 1 m for easy connection of the fitting during electrical cable installation.* *For more information, see the next section.*	

2.4 ELECTRICAL CABLING

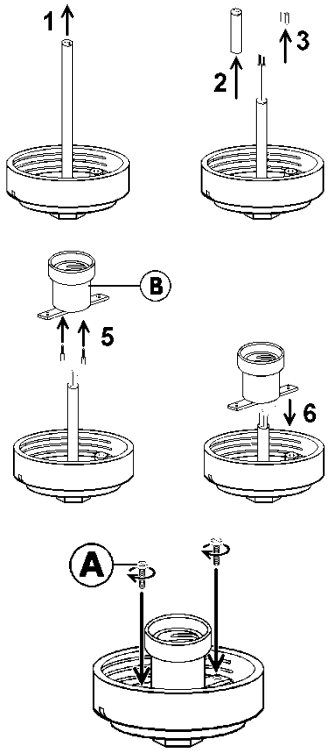
The F2.1 fittings for heliport are power supplied in voltage (230 Vac).

The fittings of the same AFL function (Approach, F.A.T.O, T.L.O.F, taxiway edge or apron edge) are supplied by one (or two) circuit(s) on which the fittings are connected in parallel.

The design of the electrical circuits must include junction boxes allowing parallel connections of the fittings. The figure below show the standard cabling:
(A = F2.1 Fitting and B = Junction Box).



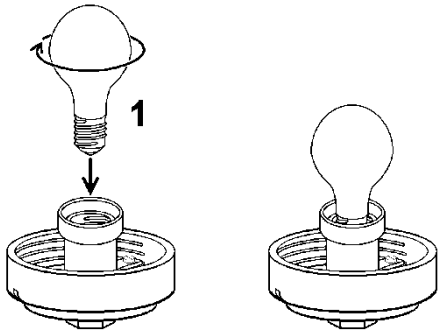
The electrical connections are always the same, and are not dependent on support mounting steps.

(a) Pull as much cable as possible out of the F2.1 mounting. (b) Strip 4 cm from the cable. (c) Strip 1 cm from each wire. (d) Connect the two wires on the lamp holder (**B**). (e) Crimp the 2 wires into the hooks of the class 2 protection cap. (f) Install the lamp holder in the F2.1 mounting. (g) Replace, screw and lock the two lamp holder fixing screws (**A**).	

2.5 MOUNTING THE LAMP

The wattage used for lamps are for each function respectively:

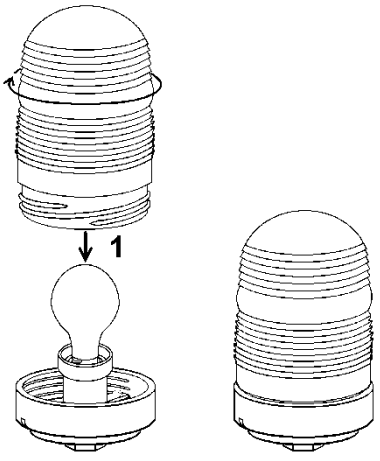
- Lighting of boundary of F.A.T.O = 105 W E27
- Lighting of boundary of T.L.O.F = 70 W E27
- Lighting of taxiway edge = 53 W E27
- Lighting of apron edge = 53 W E27

(a) Fasten the E27 lamp on the lamp holder.	

2.6 MOUNTING THE OPTICAL GLASS

The colour used for the optical glasses are for each lighting function respectively:

- Approach lighting system = White
- Boundary of F.A.T.O = White
- Boundary of T.L.O.F = Green
- Taxiway edge = Blue
- Apron edge = Blue

(a) Place the flat gasket in position in the F2.1 mounting. (b) Fasten the optical glass on the F2.1 mounting.	

3. MAINTENANCE

In this section you can find a description of the different steps for the maintenance of the fitting.

Before you start, make sure you have read and understand §1.1 Safety Instructions.

Find out the location of the light unit that needs maintenance. If the purpose is to replace an existing light unit with new one, make sure that corresponding unit is available.

WARNING! *WHEN A FITTING HAS BEEN REMOVED FROM ITS BASE, THE BASE MUST BE EITHER FITTED WITH A COVER OR A RESERVE FITTING PUT IN ITS PLACE.*

IT IS RECOMMENDED THAT ONLY AUTORIZED PERSONNEL DISASSEMBLE FITTINGS WITH PRIOR AGREEMENT FROM SAFEGATE.

3.1 BASIC MAINTENANCE PROGRAMME

There are recommended maintenance tasks to ensure that the equipment is in correct operating condition.

Maintenance tasks	
Weekly	• Visual inspection of the fitting. • Removal of dust from external surfaces of the fitting.
Monthly	• Check of the optical window, check for mechanical damage. • Check for proper fixing of the fitting in its base.
Yearly	• Detailed inspection of the fitting. • Check of the body resistance, check for mechanical damage (for example cracks around prism windows). • Clean of the optical windows.

A daily function check is referred to in the document:
ICAO, Airport Services Manual Part 9, Airport Maintenance Practice and FAA AC 150/5340-26A, Maintenance of airport visual aids facilities.

The light is designed for outdoor operation, however storing the light outside without using it is a risk for damage to light components. For a longer storage time (more than a week), it is recommended to store the light indoors in a dry and dust free environment and at room temperature. Proper storage ensures trouble free replacement procedures. It is strongly recommended not to store any electrical equipment outside.

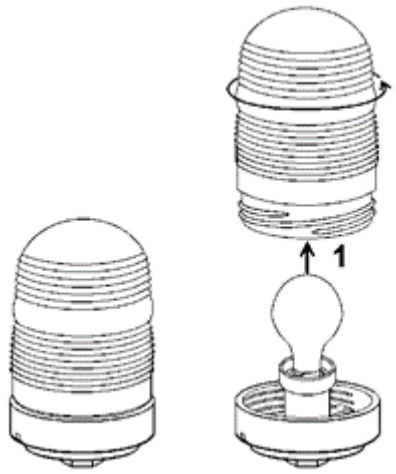
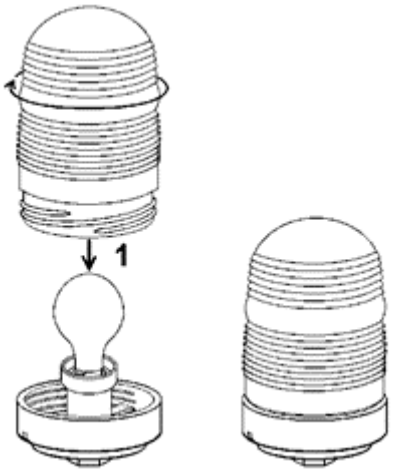
3.2 WORKSHOP MAINTENANCE

Before you start, make sure you have read and understand §1.1 Safety Instructions.

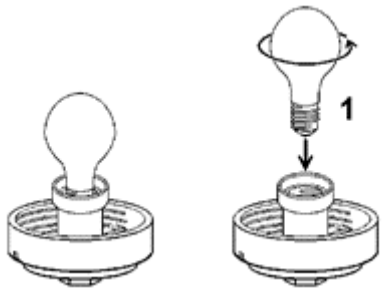
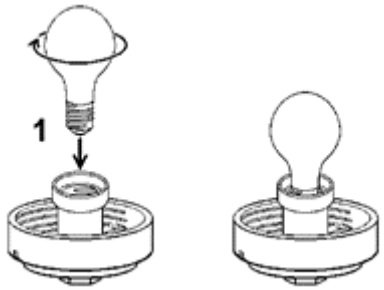
The workshop maintenance refers to following:

1. Replacing the optical glass
2. Replacing the lamp

3.2.1 Replacing The Optical Glass

Remove	
(a) Unscrew the optical glass from the F2.1 mounting.	
Replace	
(a) Put in place and screw the optical glass on the F2.1 mounting.	

3.2.2 Replacing the Lamp

Remove	
(a) Remove the optical dome (see § 3.2.1 Replacing The Optical Glass). (b) Remove the lamp from the lamp holder. Push and turn it ¼ turn in the lamp holder and then remove. (c) Replace the optical dome (see § 3.2.1 Replacing The Optical Glass).	
Replace	
(a) Remove the optical dome (see § 3.2.1 Replacing The Optical Glass). (b) Install the lamp in the lamp holder. Push and turn it ¼ turn in the lamp holder. (c) Replace the optical dome ((see § 3.2.1 Replacing The Optical Glass).	

4. SUPPORT

4.1 SAFEGATE GROUP WEBSITE

The Safegate Group Website, www.safegate.com, offers information regarding our airport solutions, products, company, news, links, downloads, references, contacts and more.
***Note**: There is also a **Client/Partner login** area for the latest information and updates, if available.*

4.2 RE-CYCLING

4.2.1 Local Authority Re-cycling

The disposal of Safegate Group products is to be made at an applicable collection point for the recycling of electrical and electronic equipment. The correct disposal of equipment prevents any potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling. The recycling of materials helps to conserve natural resources. For more detailed information about recycling of products, contact your local authority city office.

4.2.2 Safegate Group Re-cycling

Safegate Group is fully committed to environmentally-conscious manufacturing with strict monitoring of our own processes as well as supplier components and sub-contractor operations. Safegate Group offers a re-cycling program for our products to all customers worldwide, whether or not the products were sold within the EU.

Safegate Group products and/or specific electrical and electronic component parts which are fully removed/separated from any customer equipment and returned will be accepted for our recycling program.

All items returned must be clearly labelled as follows:

- For ROHS/WEEE Re-cycling
- Sender contact information (Name, Business Address, Phone number).
- Main Unit Serial Number.

Safegate Group will continue to monitor and update according for any future requirements for EU directives as and when EU member states implement new regulations and or amendments. It is our aim to maintain our compliance plan and assist our customers.
***Note**: For more information, see www.safegate.com, or contact Safegate Group Support via email at support@safegate.com or phone +46 40 699 1740.*

4.3 SPARE PARTS

Spare parts are available for Airfield Lighting. For more information see the Spare Parts List document.

***Note**: Contact Safegate Group for assistance with ordering spare parts.*

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Check in to the future

How many aircraft can your airport handle today?
Can this number be increased without adverse effects on the airport's safety level?
It is a known fact that traffic volume will rise in the foreseeable future. More movements will demand monitoring of the entire airport. Requirements will be sharpened and the development of an integrated system controlling not only ground movements but also air traffic close to the airport is of the highest interest.
The International Civil Aviation Organization (ICAO) already describes A-SMGCS, Advanced Surface Movement Guidance and Control System, as the answer to the future modern airport need to control the entire airport space in one superior system.
To a larger extent than today's systems, A-SMGCS will rely on automated processes to give both pilots and traffic controllers exact information about positions and directions. Safegate Group delivers complete A-SMGCS solutions already, as well as all vital parts relating to it.
Safegate Group can check your airport into the future – today!

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THORN Airfield Lighting IDMAN aVibit AIR TRAFFIC SOLUTIONS

SAFEGATE GROUP

Safegate Group offers solutions for increased safety, efficiency and environmental benefits to airports worldwide. The company was founded in 1973 and has its headquarters in Malmö, Sweden. Safegate Group has more than 70 partners around the globe in order to be close to its customers. Earlier members of Safegate Group include Thorn AFL and Idman, who both have over 40 years of experience in airfield lighting solutions for airports and heliports. The latest member of Safegate Group is Avibit, a leading provider of next generation software applications and integration of efficient air traffic control systems. Safegate Group's complete range of products and services, a "one-stop shop", provides solutions to customers and airborne travellers around the globe.

www.safegate.com