Opto Precision

SECURITY SYSTEMS

Daylight-independent Camera and Video Monitoring Systems

Multi-sensor Systems

NIR- and SWIR-Laser Lighting Systems
LED Light Sources

INFORMATION ADVANTAGE
THROUGH SUPERIOR
TECHNOLOGY

www.optoprecision.de

ABOUT US

COMPLETE SYSTEMS

SYSTEM COMPONENTS

OUR PARTNERS

COMPLETE SYSTEMS

MODAR

Multi-sensor systems for optimum vision in all weather conditions on land and at sea

From page 8

- Range up to 12 km
- Optimum vision even in the event of fog, rain or snow

DRIVER FRONT IMAGE SYSTEM

Mobile Driver-Front-Photo System for the taking of legally admissible, daylight-independent photographs for the identification of persons in vehicles

From page 20

- Legally admissible photographs of driver and vehicle
- 24/7

SYSTEM COMPONENTS

Laser and LED light sources for the support of various observation and monitoring tasks

LASERFLASH

Discrete, eye-safe IR laser lighting for covert investification

From page 22

- Invisible, eye-safe laser light sources
- Ranges from 15 – 5,000 m

LED SEARCHLIGHT

Searchlights for search and rescue operations over large distances

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- Spotlighting (of scenes and objects) at distances up to 2,500 m

UV-LED DOCUMENTCHECK

Special light source for the checking of documents and banknotes in official police cars

From page 36

- Mobile document checking
- For use in gloveboxes

OPTOPRECISION

INNOVATIVE SOLUTIONS FOR COMPLEX SURVEILLANCE TASKS

OptoPrecision Ltd specializes in the development, design and manufacture of sophisticated individual and complex large-scale solutions for measurement, monitoring, and control technologies.

The diverse products and developments of the company are divided into the following categories according to their fields of application:

INDUSTRIAL SOLUTIONS
Measurement, monitoring and control technology for industrial applications

SECURITY SYSTEMS
Technology for operational deployment and surveillance tasks of authorities

CLIENT-ORIENTED PRODUCT DEVELOPMENT IS OUR STRENGTH

In addition to the distribution of existing products the main focus of our work is the development of products tailored for the individual customer and the implementation of camera-based systems and Laser / LED light sources.

As medium-sized company with highly qualified teams of approx. 60 employees, we are able to flexibly respond to every customer's needs and develop individual solutions. Almost all tasks comprising design, programming and production can be performed in-house

OPTOPRECISION SECURITY SYSTEMS

Discrete Surveillance, Security and IR- laser Technology

Our SECURITY SYSTEMS division is specialized in innovative security and surveillance technologies for police, security, military forces and other organizations or companies requiring high security standards.
As manufacturer of camera-based systems for day and night applications we are specialists in the field of:

- Daylight-independent camera and video surveillance
- Actionable, high-resolution images
- Infrared laser illumination systems
- SWIR and thermal imaging
- Optics
- Image analysis, image transmission and recording
- Encrypted web-based transmission of information (satellite and mobile support)

Our SECURITY SYSTEMS product portfolio ranges from various laser and LED light sources to customer-specific tailored systems for complex naval and land-based monitoring and surveillance tasks.

As system provider we maintain tight partnerships with innovative and creative manufacturers of monitoring and security technology worldwide and are a competent partner for our customers during the acquisition process of further system components and system integration.

MODAR

MOTION STABILISED
OPTICAL
DETECTING
AND
RANGING

THE INNOVATIVE MULTI-SENSOR SYSTEM

FOR OPTIMUM VISION IN DARKNESS, FOG, RAIN OR SNOW

MODAR –The MODAR multi-sensor system developed by OptoPrecision combines all the camera technologies that are the norm on the market with our innovative laser-assisted lighting technology.

With the integrated visual axis stabilisation, MODAR can be implemented on various ships, vehicles or other carriers at sea or on land.

The modular device concept makes it possible to adjust camera channels to specific areas of application.

The georeferenced image acquisition of objects or situations is possible for distances of **up to 12 km**, also with laser lighting. The system offers the best possible visibility in nearly all weather and lighting conditions.

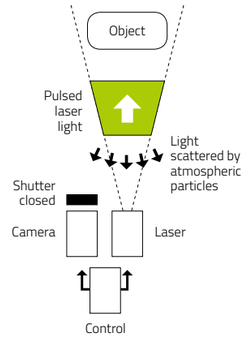
	Possible carrier systems	Area of application	Read more on:
MODAR	Large ships (>40 m)	Sea space supervision	Page 8
MODAR-BC	Smaller ships, emergency vehicles	Border supervision, research	Page 14
MODAR-HDR	Emergency vehicles	Official monitoring, for example police, customs, etc.	Page 16

Range-gated-technology

The **Range-gated camera system** by OptoPrecision is developed specially for improved visibility in darkness and other **atmospheric interferences** such as fog, rain or snow, for example.

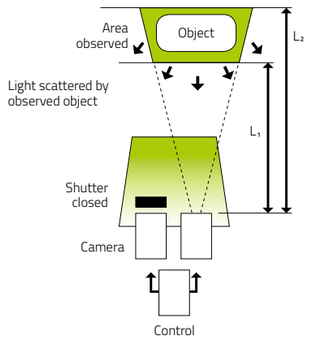
Range-gated systems combine two essential components with each other: a set, very short laser pulse and a special camera. The camera exposure is ensured in the nanosecond range by a control unit developed by OptoPrecision.

The targeted synchronisation of the laser pulse and the camera makes it possible to light a partial area determined by the distance and acquire an image in which atmospheric interferences before the partial area observed are suppressed. Interfering light sources and light reflections, such as when looking through fog, rain, snow or window panes, can be minimised, which make a decisive improvement to the image quality.



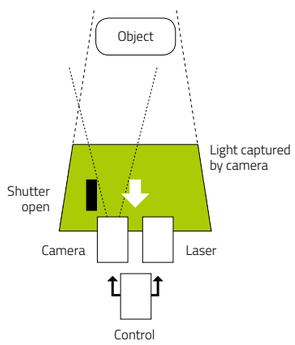
Step 1

The device sends a short laser pulse.
The camera shutter remains closed while the light between the device and the target object is scattered and reflected by atmospheric particles.



Step 2

The laser light contacts the target object and is reflected. The camera shutter remains closed and does not capture any interference light.



Step 3

The light reflected by the target object arrives at the camera and the camera opens the camera shutter for this brief moment. The shutter is then closed again, so that no interference light behind the object is captured.

MODAR

MOTION STABILISED
OPTICAL
DETECTING
AND
RANGING

INNOVATIVE MULTI-SENSOR-SYSTEM

FOR IMPLEMENTATION ON LARGE SHIPS (> 40 METRES)

The MODAR multi-sensor system was specially designed for use at sea and has already been successfully implemented on several ships of the German Federal Police/ Coastal Guard. It allows a visually exact, collision-preventing monitoring as well as a precise terrestrial localisation of swimming and fixed objects in real time, for distances of up to 12 kilometres.
Four different camera technologies, assisted by invisible laser lighting, allow the best visibility in all light and weather conditions:

- A daylight camera with a zoom lens for daytime monitoring in colour
- A low-light camera for monitoring in very low light conditions (night)
- A thermal imaging camera for detecting temperature differences
- A range-gated camera that makes it possible to reduce atmospheric interferences such as fog, rain or snow in the image. The range-gated camera uses a laser for the active lighting.

The cameras acquire in parallel, so a view change between the cameras capturing in parallel is possible at any time through the operating software, in order to choose the best channel for each observation task.

Pan-tilt head technology with swell stabilisation

State-of-the art sensor technology and drives in the pan-tilt head compensate for the movement of the observation system on two axes. The stabilisation allows monitoring across long distances and thereby ensures an overall image.
Possible atmospheric interferences in the image are suppressed by the high-tech range-gated camera technology.

CHANNEL 1: Daylight camera (colour)

A full-HD-CMOS camera with 36x optical zoom ensures a high-quality colour image in daylight and good visibility.

CHANNEL 2: Range-gated camera & short pulse laser

The range-gated camera technology/active imaging allows the fading out of atmospheric interferences and thus visibility through snow, fog and ship windows. In conjunction with a short pulse laser and an IICCD camera (Image Intensifier CCD) with a powerful lens, this makes it possible to observe objects at long distances (up to 12 km).

Laser range-finder (LRF)

The laser range-finder installed in the MODAR, mainly used for military purposes (LRF, laser class 1 M), makes it possible to precisely measure the distance of objects in a range of 5 metres to 15 km. Due to the high measurement frequency (1x per second), the LRF even reliably records objects at high speeds. The LRF also makes it possible to determine the coordinates of the target objects.

Laser safety detector

The security concept certified by the trade association ensures, through the laser security detector, that there is no danger in using the laser.

CHANNEL 3: Low-Light camera (night vision)

A very sensitive electron-multiplicator-CD camera with a 60x optical zoom provides the best image results even in extremely low light.
The laser installed on the MODAR can be used in the integrated low-light channel as a lighting source, if there is no light source close to the scene to be observed.

CHANNEL 4: Thermal imaging camera (infrared)

A thermal imaging camera with a 9x optical zoom makes it possible to detect and target ships and living objects at long distances through the detection of temperature differences (in case of fog, for example).

The windscreen wiper system allows an automatic cleaning of the camera viewing windows if necessary.

4 CAMERA CHANNELS FOR OPTIMUM VISIBILITY IN ALL LIGHT AND WEATHER CONDITIONS

Daylight camera

The strength of daylight cameras is in the creation of high-definition and very natural, detailed colour images. The use of high-quality zoom lenses allows a significant enlargement of the images. In good light and visibility conditions, the daylight camera provides outstanding image information. The autofocus ensures that the definition does not need to be subsequently corrected by hand, this can however be deactivated if necessary. An object moving at high speed may cause image distortions. The daylight camera can create images even after the beginning of dusk. In case of very low light or darkness, it cannot provide any (meaningful) images.

▷ Acquisition from approx. 1 000 m distance (wide-angle)

▷ Acquisition from approx. 50 m distance

ADVANTAGES:
- ▷ Colour image
- ▷ Autofocus

DISADVANTAGES:
- ▷ The image declines in quality at dusk
- ▷ No night images

Thermal imaging camera

Thermal imaging devices have an advantage, compared to night vision devices, that there does not need to be any minimal level of light or another source of light (for example an infrared spotlight), which may be discovered or turned off. Thermal imaging cameras can thus create pictures at night, but also in light and blinding sunlight. The thermal imaging camera reaches the limit of its capacities in case of heavy rain, fog or snow.

The picture from the thermal imaging camera is created from the recording of differences in the electromagnetic radiation of surfaces and the resulting calculated determination of temperature differences. If this difference is low, no meaningful image can be created.

Thermal imaging cameras are used for monitoring and clarification in the police or the military in case of darkness or bad visibility and for detecting or rescuing people (SAR actions, for example) or for extensive areas (border monitoring, for example). In many cases, even optically well camouflaged objects can be identified due to their warmth signature. For machines or other technological installations, spots with elevated temperatures can be detected with thermal imaging, giving clues as to possible damage or dangers (tanker fuel drainage or fire, for example).

▷ Acquisition from approx. 900 m distance

▷ Acquisition from approx. 700 m distance

ADVANTAGES:
- ▷ Detection of temperature differences even through fog
- ▷ Simple detection of living objects (body temperature)

DISADVANTAGES:
- ▷ The image declines in quality in heavy rain and snow
- ▷ No depiction if objects have the same temperature radiation intensity
- ▷ No colour information: dark surfaces can appear light and light surfaces dark

4 CAMERA CHANNELS FOR OPTIMUM VISIBILITY IN ALL LIGHT AND WEATHER CONDITIONS

Low-light camera

The low-light camera is specifically designed for use in difficult lighting conditions and darkness with some residual light (starry sky or moonlight, for example). If no source of light is present close to the scene to be observed, the laser in the low-light channel integrated in the MODAR can function as an invisible lighting source.

The long focal range of the zoom lens (FOV 0.3 °) also allows a good recognition of objects at long distances. The camera is also suitable for use during the day and for large distance ranges due to its high dynamic range and its lens aperture.

▷ Acquisition from approx. 700 m distance

▷ Acquisition from approx. 4 000 m distance

ADVANTAGES:
- ▷ Longest focal range (FOV 0.3°)
- ▷ High dynamic range (day and night use)
- ▷ The laser can be used as light source

DISADVANTAGES:
- ▷ Grayscale image
- ▷ Low lighting without an additional light source leads to a smoky image
- ▷ The image is influenced by particles (dust, snow, rain)

Range-gated camera

The range-gated camera system was specifically developed by OptoPrecision to significantly improve visibility in darkness and in case of atmospheric interferences such as fog, rain or snow, for example.

In the range-gated system, a very short laser pulse is sent in the direction of the target object. The camera shutter remains closed until the light reflected by the target object arrives at the camera. The camera shutter opens for this brief moment and is then closed again, so that no interference light is captured. This technique makes it possible to fade out atmospheric interferences in the image or to see through window panes for example, through the fading out of light reflections and interference light. The range-gated technology allows an observation of objects up to 12 km away, depending on the lighting and weather conditions.

This system does not work in daylight or sunshine, as the intensity of the sunlight is higher than that of the laser, which is why the range-gated camera system should not be used during the day.

▷ Acquisition from approx. 700 m distance

▷ Acquisition from approx. 4 000 m distance

ADVANTAGES:
- ▷ Active laser lighting with long range
- ▷ Fading out of atmospheric interferences
- ▷ Increased visibility in case of fog, snow or rain
- ▷ Distance information possible in the picture

DISADVANTAGES:
- ▷ Day use should be avoided
- ▷ Grayscale picture

MODAR-BC

MOTION STABILISED
OPTICAL
DETECTING
AND
RANGING

INNOVATIVE MULTI-SENSOR SYSTEM

FOR IMPLEMENTATION ON SMALL SHIPS OR VEHICLES

The MODAR-BC by OptoPrecision was developed for implementation on smaller ships or vehicles after the successful introduction of the MODAR technology on German Federal Police ships. The MODAR-BC is accordingly smaller, with only slightly reduced performances.

It also allows optical monitoring in nearly any weather conditions, day and night. Object-tracking, sector scan as well as optional large depiction of the camera channels make it possible to analyse the right image source for each situation. As well as the high-performance uncooled and thus very long-lasting thermal imaging camera, the laser lighting invisible to the naked eye is a particularly effective tool in the service of public security. Scenes with difficult lighting conditions can thus be significantly lit.

Atmospheric interferences as well as seeing through window panes are no longer obstacles. The MODAR-BC is also equipped with the gyro-stabilised pan-tilt head. Particularly high-quality drivers without backlash are used for this, as they are well-suited to the permanent compensation of the vehicle movement. The precise direction of the camera channel visual axes thus achieved makes it possible to monitor objects at large distances.

The permanent overview with simultaneous analysis of details on the target object is ensured by the MODAR-BC with the help of the different camera channels and zoom lenses. The operator panel for controlling the device is laid out as in the larger MODAR.

CHANNEL 1: Range-gated camera & daylight camera (colour)

The channel 1 contains a daylight camera with five megapixels as well as a zoom with a focal range of 20 to 750 mm for optimum visibility in daytime.
For bad visibility conditions (fog, rain, snow…) or in darkness, it is possible to switch to the range-gated camera. The laser of the range-gated channel can also be used as a source of light to support the daylight camera.

Laser range-finder (LRF)

The laser range-finder installed in the MODAR-BC (LRF, laser class 1 M) makes it possible to precisely measure the distance of objects up to 10 kilometres away. Due to the high measurement frequency (up to 20x per second), the LRF even reliably records objects at high speeds. The LRF also makes it possible to determine the coordinates of the target objects.

CHANNEL 2: Thermal-imaging camera (infrared)

A thermal imaging camera with a 9x optical zoom makes it possible to detect and target various objects or people at long distances through the detection of temperature differences (in case of fog, for example).

Short pulse laser

In conjunction with the range-gated camera, this source of light allows the selective lighting of scenes in a chosen distance range.

Laser safety detector

The security concept certified by the trade association ensures, through the laser security detector, that there is no danger in using the laser.

The windscreen wiper system allows an automatic cleaning of the camera viewing windows if necessary.

MODAR-HDR

MOTION STABILISED
OPTICAL
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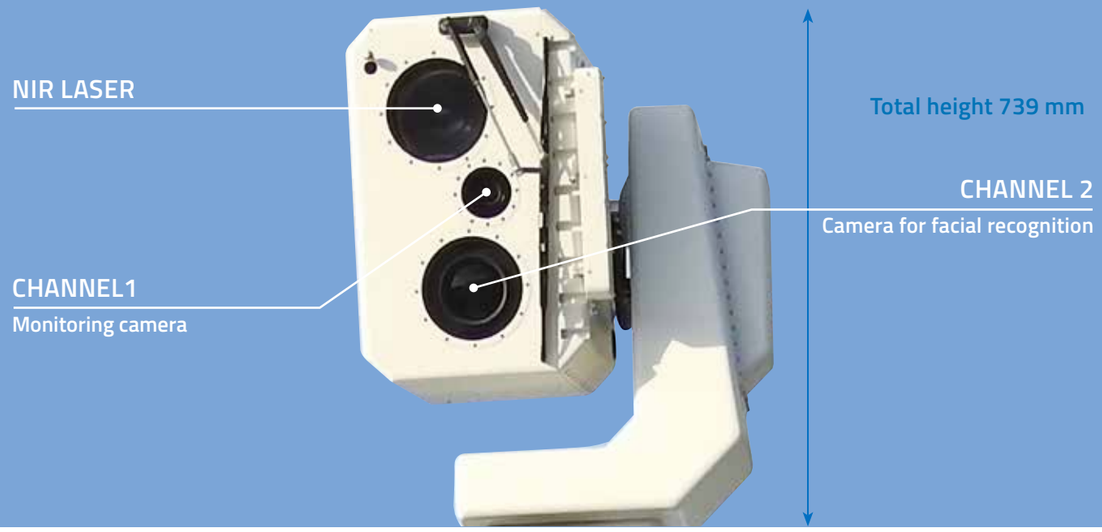


INNOVATIVE MULTI-SENSOR SYSTEM

FOR IMPLEMENTATION IN VEHICLES

The MODAR-HDR multi-sensor system allows the monitoring and identification of people as well as the acquisition of high-definition pictures of faces, day and night.
The assistance of NIR laser technology and the use of special interference filters allow the MODAR-HDR to recognise drivers in a range of up to 400 m in practically all lighting and weather conditions.

The high-definition images are recorded, optimised and analysed by our software in real time. The simultaneous depiction of overview and detailed images make it possible to keep an overview of a crowd of people or a scene, while identifying individual people.

The successful suppression of interfering light sources (headlamps, street lamps or sunlight for example) developed through our technology and the minimisation of atmospheric interferences are essential in many situations to obtain evidence-worthy images.

For the public space and for short-range requirements, exclusively eye-safe lasers of the laser class 1 are used.
For particular tasks or for long-range setups, lasers of the laser class 4 (not eye-safe) can also be used, as they allow a longer monitoring range of up to 2-3 km.

The MODAR-HDR is optimally equipped for use in vehicles (Mercedes Sprinter, VW Crafter, etc.) through the pan-tilt system with line of sight stabilisation and the solid and robust casing (protection class IP67).

With its telescopic mast, the MODAR-HDR can also be extended to a height of up to 4 meters above the ground. Depending on the vehicle type and customer requirements, the MODAR-HDR can disappear completely into the emergency vehicle or return to a case on top of the vehicle roof. The construction of the vehicle, the equipment of the PC work stations in the vehicle as well as the system integration of the MODAR-HDR are conducted by OptoPrecision.

CHANNEL 1: Overview camera

The channel 1 contains a high-definition 4.2-megapixel daylight and night vision camera for overview pictures with filter changer with IR edge and bandpass filter.

NIR LASER

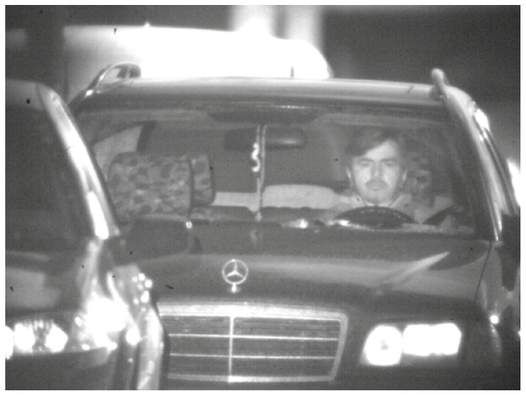
With the zoom lenses, synchronised additional lighting sources for the cameras on channels 1 and 2. Lighting of target objects up to 2-3 km away.

CHANNEL 2: camera for facial recognition

The channel 2 contains a high-definition 4.2-megapixel daylight and night vision camera with a 40-1500 mm zoom lens and filter changer with IR edge and bandpass filter.

The windscreen wiper system allows an automatic cleaning of the camera viewing windows if necessary.

▷ Acquisition from approx. 20 m distance



▷ Acquisition from approx. 400 m distance

Software features

- ▷ Selection and operation of the various camera channels and zoom lenses
- ▷ Control of the laser lighting sources
- ▷ Control of the pan-tilt system by
  - Position/contour programming
  - Sector programming
  - Target recording via radar tracking
  - Target tracking via video tracking
- ▷ Range measurement via laser range finder
- ▷ Operation of the windscreen wiper system
- ▷ User-friendly operating console
- ▷ Web server module
- ▷ Image and video archiving

MODAR-SOFTWARE

The MODAR-software and the user-friendly operating console make it possible to control all functions, camera settings, image display as well as the setting of the pan-tilt head fully automatically from the PC, with keys or joystick controls. The pan-tilt system is controlled manually via joystick and operating console, automatically by radar, position/contour or sector programming or target tracking in the image.

WEBSERVER-MODULE

The web server-module provides the possibility of transferring the images acquired by the MODAR in real time and in various levels of definition (depending on the available bandwidth) in encrypted form via the internet. To view the images, several users can receive access with various levels of permission.

All camera channels are permanently displayed in the background with metadata such as the time, date and position of the monitoring vehicle and of the target. This display is conducted in an internal ring memory, out of which data is extracted only in case of relevant procedures and is transferred with the equivalent procedure numbers. Data protection requirements are thus also accounted for.
MODAR is a modular system with adjustment possibilities according to customer requirements.

Adjustment possibilities according to customer requirements:

RANGE-GATED CAMERA

HD camera with image intensifier and extremely short exposure time. Interference filter with 8 nm bandwidth, zoom lens with 750 mm focal length, design for object distances up to 8 000 m

THERMAL IMAGING CAMERA

Uncooled HO thermal imaging camera for maintenance-free operation with 25 – 225 mm zoom lens

LOW-LIGHT CAMERA

HD-CMOS camera providing colour images well into dusk. For maximum sensitivity, switch to black and white mode. The zoom lens is shared with the RG camera

LASER LIGHTING

The illuminated solid angle is automatically adjusted to the zoom setting of the RG camera lens. Wave length 808 nm, 10 W average power, equipment with laser security detector. Working distance up to 8 000 m

PAN-TILT HEAD

Drive with 0.01 mrad. (0.00057°)
Definition, no backlash, long lasting

CAMERA HEAD

IP67-protected, running temperature: -40 to +55 °C. Integrated windscreen wiper with spray nozzles for cleaning liquid.

COMMUNICATION

The communication between the MODAR and the control unit is ensured by a glass fibre hybrid cable.
There is a 10 gigabit LAN (R 45) network connection between the control unit and the recorder and the external world:

CONTROL UNIT

Hardware module:
Power supply 230 VAC 50 Hz / 12 V DC, other currents upon request. UPS, computer, monitor, hardened special keyboard with control handles.

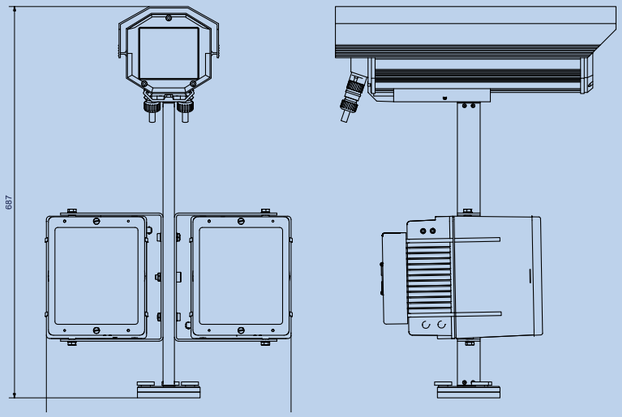
CONTROL SOFTWARE

All camera settings, image display and the direction of the pan-tilt head are controlled by the control unit through the control software.
Video tracking, compression of the video flows for network transmission and recording.
Various options: automatic facial recognition, for example

CLEANING UNIT

20-l tank with integrated pump for cleaning fluid, with frost-protection if needed.

DRIVER-FRONT-PHOTO SYSTEM (FFS)



NIR-LASER-CAMERA SYSTEM

Actionable image recording of persons and vehicles (24/7)

The driver front-photo system consists of all the necessary system components for the registration of vehicles with driver and license plate at full speed.
The system is designed for the integration into a surveillance vehicle to be located no more than 80 m away from the near-infrared (NIR) camera-laser unit.

The system consists of components of particularly high quality in order to provide the best possible image quality, so that a clear image of the driver can be recorded and evaluated. For this purpose, a 4.2 MP camera in concert with high dynamic range and the near-infrared illumination technology LaserFlash is being deployed.

Privacy regulations are not being violated at any time, since recording is triggered only on demand and for a limited duration.

Product Features

- Data usable in court for driver registration
- 24 h driver and license plate registration
- Clearly visible pictures across windshields
- Flash invisible to human eyes
- Video and/or single-frame recording
- FFS can be emplaced up to 80 m away from the emergency vehicle
- Easy alignment on the roadside

Technical Details

- Ultra-sensitive 4.2 MP CMOS camera with narrow band interference filter
- Eye-safe yet powerful illumination based on laser technology
- Recording is completely independent from daylight
- Processing of image data with 12-bit gray scale dynamic
- External triggering of recording sequence
- Storage with standard network recorders
- Recording with commercially available data storage and formats
- Open interfaces
- Integration into digital network recorders

Additional Technical Details

Wavelength	808 nm
Emission Angle	3°
Recording Distance	20 m
Frame Rate	max. 30 Hz
Effective Pixels	4,2 Megapixels

▷ Driver recognition: Reduction of stray light by using optical filters and NIR laser illumination

Application

- Driver recognition in distance violations without visible flash
- Driver recognition in speeding violations without visible flash
- Search for criminals on roads without stopping traffic
- Recording for subsequent database comparison with black or white list
- Equipment for automatic gate for access control

Contents/Components

- Camera-Laser-Unit
- Controller and recording software
- Controller-Box
- Tripod
- Heavy Duty PC
- Cable drum with optical fiber and copper cables
- Transport box
- Recorder software for video recording
- Instructions

LASERFLASH

Eye-safe IR laser illumination for under-cover investigations

Our infrared laser illumination systems LaserFlash are designed for professional applications of investigating authorities to illuminate objects at short, medium and long ranges. The invisible, eye-safe laser light allows the authorities to operate safely in public areas to illuminate observation objects over a distance of several hundred meters without being detected in situations of poor visibility or at night.

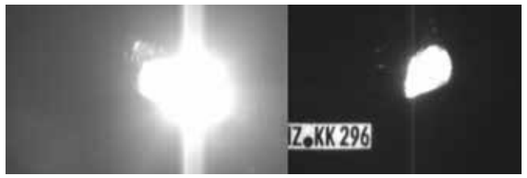
Our laser systems have been used by the authorities for many years and always meet the highest standards of reliability, luminous efficiency and user-friendliness.
The laser safety is guaranteed by the professional association. The devices help officials with difficult tasks, such as reading license plates at night, looking through windows, looking through stray light or night observations.

Product Features

- Eye-safe, invisible light (laser class 1)
- Suitable for all common camera types (analog, digital with TTL Sync, network camera)
- All devices suitable for outdoor use
- Mobile use thanks to 12 V operation
- Option to switch from laser class 1 to laser class 3 R to extend range
- Different emission angles (angles 3°, 5° and 12°) thanks to changeable optics

LED vs Laser Illumination

The laser is not brighter but offers linearly polarized light with a bandwidth narrower than LEDs minimizing the disturbing influence of other light sources such as vehicle headlights. This advantage makes it especially appealing for professional use and enables the user to take pictures even under the most difficult conditions.



OVERVIEW LASERFLASH MODELS

The following table introduces you to the most important data of all available laser illuminations. Please contact us in case you require a customized version.

If the necessary technical feasibility is confirmed we will send you an offer for a customized device.

	Wavelength [nm]	Max. Range [m] (depending on various other parameters)	Available Emission Angles [°]	Suitable Camera Types	Laser Protection Class	Dimensions [mm] WxHxD	Voltage [V]	Protection Class
LaserFlash P TTL	785, 808 or 940	150@940nm 250@808nm	3°, 5°, 12°, 23°	Digital with TTL Sync.	1 or 1/3R-Kombi	129x122x 152	12 V DC	IP65
LaserFlash P IT	785, 808 or 940	150@940nm 250@808nm	3°, 5°, 12°, 23°	Analog	1 or 1/3R	129x122x152	12 V DC	IP65
LaserFlash P QCW	785, 808 or 940	120@940nm 200@808nm	3°, 5°, 12°, 23°	All	1 or 1/3R	129x122x152	12 V DC	IP65
LaserFlash Plus TTL	785, 808 or 940	250@940nm 500@808nm	3°, 5°, 12°, 23°	Digital with TTL Sync.	1 or 1/3R	202x215x280	12 V DC	IP65
LaserFlash Plus IT	785, 808 or 940	250@940nm 500@808nm	3°, 5°, 12°, 23°	Analog	1 or 1/3R	202x215x280	12 V DC	IP65
LaserFlash Plus QCW	785, 808 or 940	200@940nm 400@808nm	3°, 5°, 12°, 23°	All	1 or 1/3R	202x215x280	12 V DC	IP65
LaserFlash F 940	940	100	0,2°, 3°, 5°, 12°, 23°	All	1 or 1/3R Combi	120x232x272 Optics: Ø25/50	12 V DC	From Fiber Outlet IP65
LaserFlash Compact	905	15	30°	All	1	34x105x170	12 V DC Batterie 230 V AC	IP65
LaserFlash BC	808 (940)	5.000	0,2° - 20°	All	4	323x239x334	12 V DC	IP65
LaserFlash BC-S7	808 (940)	5.000	0,2° - 20°	All	4	200x206x505	12 V DC	IP65
LaserFlash F 1550	1550	600@LK1 2.000@L	0,2°, 3°, 5°, 12°, 23°	All	1 or 1/3R Combi	120x232x272 Optics Ø25/50	12 V DC	From Fiber Outlet IP65

POSSIBLE APPLICATIONS

Our LaserFlash product line supports police, customs and other security agencies to perform covert investigations. The invisible, eye-safe laser light allows the forces to observe objects over a distance of several hundred meters in poor visibility or at night, without being detected.

Scattered Light Suppression

Video cameras are very sensitive to disturbing light intensity peaks (such as car headlights) and changing light conditions especially in the dark, leading often to over-exposure rendering the objects in an unsatisfactory quality. Our LaserFlash devices suppress the visible light by using an interference filter. Glare from flashlights or other light sources is avoided. Compared to LED IR illuminations, IR laser illuminations emit waves in a very narrow spectral range (2-4 nm), which reduces stray light up to 6 times more efficiently.

◁ *Top: Sensor override without laser. Below: High-contrast video image decoupled from stray light.*

Support of IP & analog cameras

Variations of the LaserFlash P & Plus are offered in operating modes IT and QCW. The IT variant is synchronized with the video signal of an analogue camera providing the maximum amount of light during the exposure time. The QCW variant functions with both IP and analogue cameras. No coupling with the camera has to be performed because the system emits laser pulses at 300 Hz. The simultaneous integration of several cameras ensures a high level of usability.

◁ *LaserFlash products support cameras with analog and IP video output.*

Less disturbing sunlight reflections thanks to polarized IR laser light

Disturbing reflections caused by sunlight are reduced by a polarizing filter and powerful IR laser illumination. Compared to other IR light sources the laser light is polarized and passes through the filter. Disturbing sunlight is reduced by means of special filters and active IR illumination.

◁ *Disturbing sunlight is reduced by special filters while being actively illuminated with IR light.*

Application in public space with eye-safe IR laser illumination

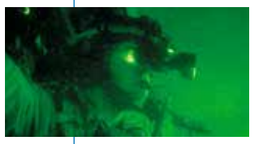
Our Laser Class 1 IR laser illumination is eye-safe and can therefore be used in public areas. The laser safety of the products has been certified by the professional association ETEM.

◁ *Top: Three levels at a distance of 200 m. The stray light is suppressed by the street lighting.*
Bottom: Observation of a person 150 meters away.

Vehicle registration number through backlight

Until now reading of license plates at low beam conditions was limited. For the first time it is possible to read vehicle license plates stray light conditions using high-performance IR laser illumination in conjunction with an interference filter.

◁ *License plate recognition with and without laser illumination and filter.*



Support for night vision and targeting devices with image amplifier

The different LaserFlash QCW models support night vision devices and target devices with IR image amplifier devices. As surface illumination, the lasers can illuminate a scene and provide the user with a formidable advantage, rendering the surroundings with more contrast and detail.

◁ *Passive laser light for special forces and sharpshooters relying on night vision devices*

Observation from an apartment

Windows are the key factor when observing from a conspiratorial apartment. The powerful LaserFlash P & Plus variants can be used behind window panes to illuminate a scenery in the outdoor area. Depending on the IR absorption properties of the window glass the range might be affected accordingly.

◁ *Laser and camera observation through the windows of a conspiratorial apartment.*

Looking through windows

Especially at dusk, the view into a room is being obstructed by reflections when overcast or by street lighting at night.
LaserFlash P and Plus models are therefore ideal for taking high-contrast pictures through windows.

◁ *Top: Observation at a distance of 40 m without Laser.*
Bottom: Observation at a distance of 40 m with Laser.- interior is visible..

Discrete video surveillance at night

Our LaserFlash devices illuminate a dark scene over large distances with light completely invisible to the human eye. For different applications we offer different models and wavelengths. People and objects can be observed in high image quality unnoticed and in secret.

◁ *Observation at a distance of 80 m without attracting attention.*
Top: Without Laser Bottom: with Laser.

LASERFLASH

LASERFLASH COMPACT

- Invisible short-range illumination
- Integrated Li-Ion battery for off-grid operation
- 24/7 operation with external power supply
- Good lighting conditions despite stray light
- Outdoor capability up to IP-65

PRODUCT DESCRIPTION

LaserFlash Compact is able to illuminate rooms and other target scenarios with invisible infrared laser light and stabilizes (2) the lighting conditions during undercover video surveillance. Distances of 15 m (1) can be illuminated temporarily for one night using the built-in lithium-ion battery or permanently with the power adapter. **LaserFlash Compact** is operated by a push-button and can therefore be activated within seconds.

Synchronization with the camera is not necessary and no cable connections are required. Its unobtrusive design allows the device to be left behind without arousing immediate suspicion.

The laser is absolutely harmless and can therefore be used without any reservations.

Important Technical Details

Wavelength	905 nm
Range	15 m
Synchronization with analog Camera	No
Digital-Camera ready	Yes
Available Emission Angles	30°

LASERFLASH F

- Discrete system thanks to small size
- Invisible illumination for medium ranges
- Stable lighting conditions with stray light
- Password protected activation of laser class 3R mode

PRODUCT DESCRIPTION

LaserFlash F infrared laser illumination is suitable for discrete monitoring tasks up to a maximum distance of 50 m (1). The light is guided via an optical fiber to a small lens, which can be mounted outdoors. The optical fiber is available up to a length of 15 m. This allows a very high degree of concealment.

The use of infrared lasers can reduce the influence of disturbing light and lighten dark areas. This allows undercover operations in the most difficult lighting conditions.

Important Technical Details

Wavelength	940 nm
Range	LK1/15 m, LK3R/50 m, LK4
Synchronization with analog Camera	Yes
Digital-Camera ready	No
Available Emission Angles	3°, 5°, 12°, 23°

(1) Range depends on the wavelength used, sensor sensitivity, reflectivity of the object, transmission of the lens (max @ 785 nm)

LASERFLASH P IT

- IR illumination up to an effective range of 250 m (1)
- Bright and cost-effective thanks to integrated TrigBox
- Compact size
- Invisible and eye-safe light
- Suppression of interfering light influences
- High image quality even in difficult light conditions

PRODUCT DESCRIPTION

LaserFlash P IT is able to illuminate objects with invisible laser light at distances of up to 250 m (1).
To use the maximum amount of light, the integrated electronics synchronize the laser with the exposure time of the analog video camera.

In combination with an infrared-sensitive camera, the LaserFlash P IT is ideally suited for covert investigations or military operations.
Its compact design makes it ideal for mobile applications.
The beam angle can be easily adapted to the different applications with the available lenses.

Important Technical Details

Wavelength	785/808/940 nm
Range at 785/808 nm	up to 250 m
Range at 940 nm	up to 150 m
Synchronization with analog Camera	Yes
Digital-Camera ready	YES
Available Emission Angles	3°, 5°, 12°, 23°

LASERFLASH P QCW

- IR illumination up to an effective range of 200 m (1) Invisible and eye-safe light
- Suitable for IP and analog cameras without synchronization
- Compact size
- Suppression of interfering light influences
- Application with laser class 3R possible for long distances
- High image quality even in difficult lighting conditions

PRODUCT DESCRIPTION

LaserFlash P QCW illuminates objects with invisible laser light at distances of up to 200 m (1) without having to sync with the cameras used. Several cameras and night vision devices can be supported at the same time with infrared light for demanding night-time observations.

The 12 V operating voltage is ideal for mobile applications. The beam angle can be easily adapted to the different applications with available lenses.

Important Technical Details

Wavelength	785/808/940 nm
Range at 785/808 nm	up to 200 m
Range at 940 nm	up to 120 m
Synchronization with analog Camera	No
Digital-Camera ready	Yes
Available Emission Angles	3°, 5°, 12°, 23°

(1) Range depends on the wavelength used, sensor sensitivity, reflectivity of the object, transmission of the lens (max @ 785 nm)

LASERFLASH

LASERFLASH PLUS IT

- IR illumination up to an effective range of 500 m (1)
- Bright and cost-effective thanks to integrated TrigBox
- Invisible and eye-safe light
- Suppression of interfering light influences
- Application for long distances with laser class 3R available
- High image quality even in difficult light conditions

PRODUCT DESCRIPTION

LaserFlash Plus IT is able to illuminate objects with invisible laser light at distances of up to 500 m (1). The integrated electronics synchronize the laser with the exposure time of the camera in order to use the maximum light intensity.

In combination with an infrared-sensitive camera, **LaserFlash Plus IT** is ideal for covert investigation.

The beam angle can be easily adapted to the different applications with the available optics.

Important Technical Details

Wavelength	785/808/940 nm
Range at 785/808 nm	Up to 500 m
Range at 940 nm	Up to 250 m
Synchronization with analog Camera	Yes
Digital-Camera ready	No
Available Emission Angles	3°, 5°, 12°, 23°

LASERFLASH PLUS QCW

- IR illumination up to an effective range of 400 m (1)
- Invisible and eye-safe light
- Without synchronization for IP and analog cameras
- Suppression of interfering light influences
- Application with laser class 3R possible for long distances
- Easy installation, compact design and sturdy design
- High image quality even in difficult light conditions

PRODUCT DESCRIPTION

LaserFlash Plus QCW is able to illuminate objects with invisible laser light at distances of up to 400 m (1) without synchronizing with the cameras being used. Several cameras and night vision devices can be supported at the same time with infrared light for demanding nighttime observations.

The 12 V operating voltage is ideal for mobile applications. The beam angle can be easily adjusted to different applications with the available lenses.

Important Technical Details

Wavelength	785/808/940 nm
Range at 785/808 nm	Up to 400 m
Range at bei 940 nm	Up to 200 m
Synchronization with analog Camera	No
IP-Camera ready	Yes
Available Emission Angles	3°, 5°, 12°, 23°

(1) Range depends on the wavelength used, sensor sensitivity, reflectivity of the object, transmission of the lens (max @ 785 nm)

LASERFLASH BC

- Invisible laser light to enhance vision with night vision devices and cameras
- Increased security thanks to remote control
- Illumination up to 5 km (depending on various parameters)
- Available wavelengths 810 nm and 940 nm
- Integrated pan-tilt unit
- For mobile outdoor use
- Robust housing
- Safe illumination of the object while staying under cover

PRODUCT DESCRIPTION

LaserFlash BC is a new product in the series of long-range IR laser illumination at OptoPrecision. The remote-controlled laser illumination was especially designed for outdoor applications like border patrol and coastal protection providing IR light for very long distances of up to 5 km. Thanks to LaserFlash BC the possible applications of night vision devices and infrared sensitive cameras can be significantly improved. The opening angle can be freely selected by remote control ranging from 0.2 to 20 °allowing light adjustments for any application. The integrated pan-tilt unit allows remote adjustments of the beam orientation.

Thanks to the wireless remote-controlled system the user does not need to stay in the immediate vicinity of the device. This feature allows the application of LaserFlash even for demanding military tasks in which active light sources can only be used to a limited extent.

By illuminating large areas and greatly improving the vision of personnel the system thereby increases safety and success.

LASERFLASH BC-S7

- Invisible laser light to enhance vision with night vision devices and cameras
- Illumination up to 10 km (depending on various system parameters)
- Available wavelengths 810 nm and 940 nm
- Remote control via IP interface
- Beam diameter changeable during operation
- Seawater resistant
- Robust housing

PRODUCT DESCRIPTION

LaserFlash BC-S7 is a long-range IR laser illumination for naval, coastal and border surveillance applications or can also be mounted on vehicles. The extremely robust housing is made of seawater-resistant aluminum. The military-grade plug-in connections and windscreen washer system allow reliable operation in harsh operating conditions and environments.

LaserFlash BC-S7 emits laser light at 810 nm (other wavelengths are available optionally) very suitable for CCD / CMOS / EMCCD cameras as well as night vision devices with image amplifiers. The opening angle is freely selectable ranging from 0.2° - 20° degrees. The laser flash BC-S7 is controlled via IP interface.

Stealthy Light Source for Observation Operations

Short Wave Infrared (SWIR) laser illumination systems are an absolute novelty. For the first time it is possible to generate light for observation operations without being detected by third parties.

Applications

You can use LaserFlash F 1550 whenever you need to perform discreet monitoring missions and alternative technology will not give you any satisfactory results.

That's the case if:

- thermal imagers do not provide sufficient detail
- Image amplifiers cannot be used due to backlight
- It is too dark for low light cameras
- Near-infrared light sources are detected by reconnaissance

Very Stealthy

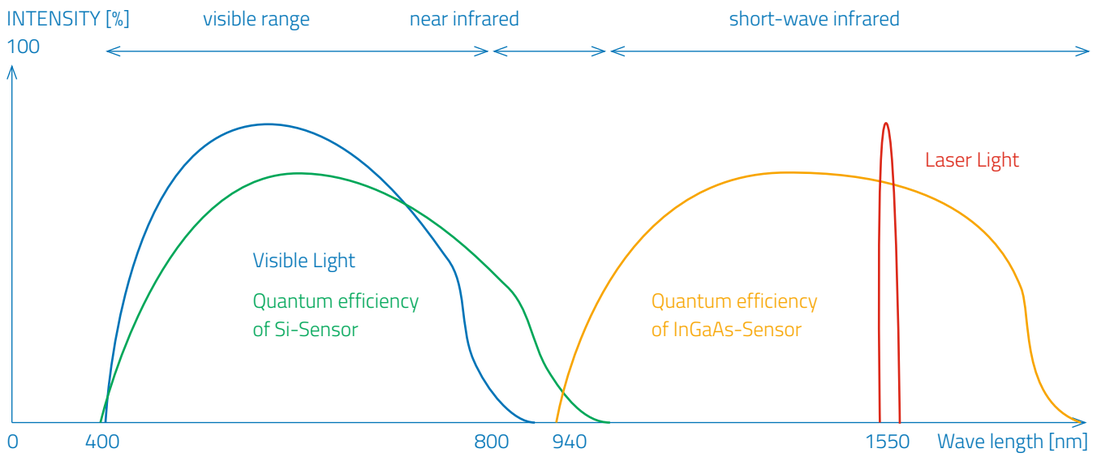
All commercially available cameras (camcorders, mobile phones, CCTV cameras, DSLR cameras, etc.) are equipped with silicon sensors. Due to the physics involved these devices can only detect light up to a maximum wavelength of 1100 nm.
The all new SWIR light source emits laser light at 1550 nm and is therefore not detectable by commercial cameras. This is a massive advantage over systems in the near-infrared spectral range.

Long Ranges

LaserFlash F 1550 is equipped with very small, inconspicuous wave optics only 25 mm or 50 mm in diameter and can be camouflaged excellently. Taking into account the regulations for laser protection the system achieves very high ranges of up to 500 m.
Ranges up to 2,000 m are possible with the collimated laser beams.
The light emission angle can be easily changed by replacing the lenses on site. This can be done by the user within a short period of time.
The system can be operated vis the base unit and the USB interface from a PC.

High Safety-Levels for User, Target Individuals and Investigation

The safety of people is very important to us.
For this reason, the laser safety of our systems is tested, controlled and certified by the independend „Berufsgenossenschaft".
By default, LaserFlash F 1550 is operated with laser class 1. After entering a password, the device can be switched to laser class 3R / 4, which is not safe for the eyes, but allows higher distances. This option is visually displayed on the device if active.



Optical spectrum of SWIR Laser Illumination Systems

House at a distance of 550 m.
(50 mm laser head, eye-safe)

Site trailer at a distance of 230m.
(25 mm laser head, eye-safe)

Looking through window, distance 100 m.
(50 mm laser head, eye-safe)

**Please contact us if you want to test the system.
We would like to arrange an appointment for product demonstration.**

LASERFLASH F 1550

- Not detectable with commercial camera technology
- High ranges
- Very flexible
- Stable light conditions in stray light
- Password protected laser class 3R / 4 mode

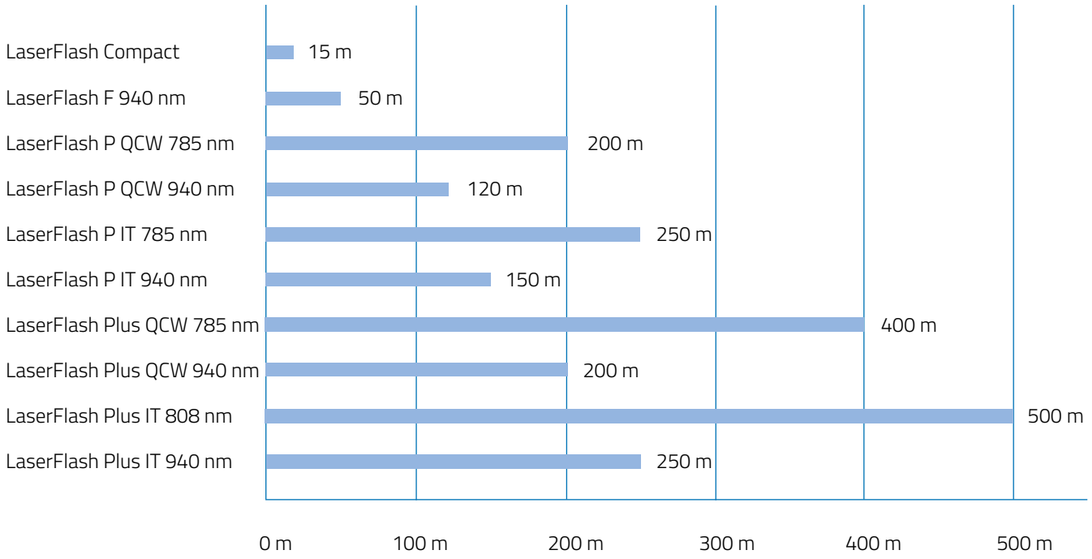
PRODUCT DESCRIPTION

LaserFlash F 1550 is the next generation of laser light sources for highly sensitive video surveillance. The illumination emits at SWIR (short wave infrared) range of 1550 nm and is not detectable with conventional cameras or night vision devices. As a result, the LaserFlash F 1550 and other SWIR systems from Opto-Precision are also suitable for the use against serious criminals.

Eye-safe applications in close ranges are possible thanks to the availability of different diffuser optics and password-protected power settings.
Illuminating with collimator optics is possible in distances greater than one kilometer with a low NOHD (Nominal Ocular Hazard Distance). The lighting, together with a dedicated SWIR camera, creates a unique surveillance system opening up new opportunities in the fight against crime and significantly improves the safety of policemen and personnel.

LASERFLASH

RANGE OF LASERFLASH-MODELS

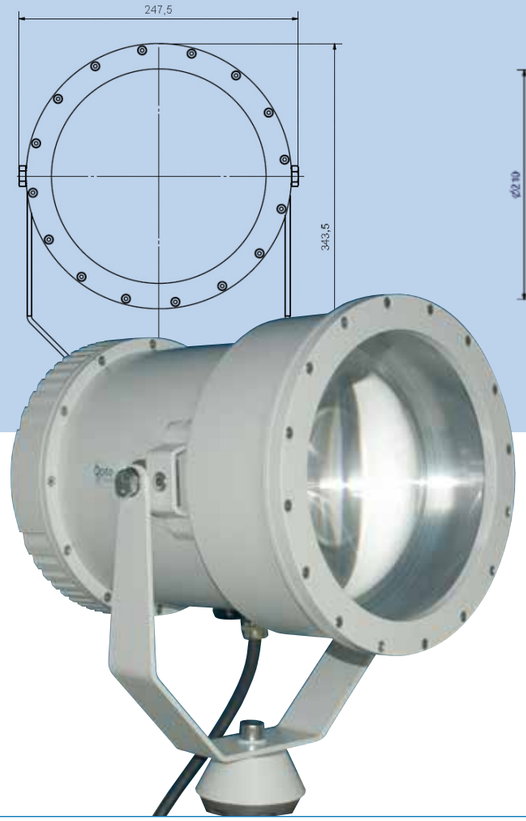


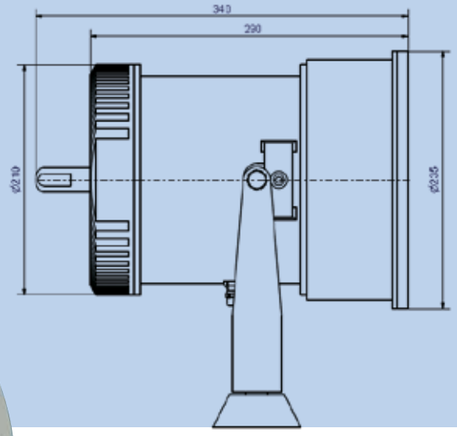
ACCESSORIES FOR LASERFLASH DEVICES

ITEM	FUNCTION	TECHNICAL DESCRIPTION
Interference Filter	Filter for the suppression of interference	Interference filter for 5 mm C-Mount intermediary ring Available wavelengths: 785, 808, 905, 940 nm
Tripod adapter plate	For the attachment of a camera and LaserFlash to a standard tripod.	Adapter plates available for LaserFlash P and LaserFlash Plus.
Image stabilization	Significant improvement of image quality and increase of information content.	Processes analog video signals
Front frame	The front frames determine the radiation angle of the laser beam.	Horizontal: 3°, 5°, 12° oder 23° Vertical: 3°, 5°, 12° oder 23°
Twilight sensor	Turns lasers on in the dark and turns them off in day-light conditions.	Available for the current models of LaserFlash P, Plus and F series.

Furthermore, we offer you tripods, power supply units, spacer rings, filters, tailor-made carrying cases as well as special lenses and cameras.

LED SEARCHLIGHT





LED SEARCHLIGHT

for spot illumination of scenes and objects at distances up to approx. 2,500 m

LED searchlight OPS was developed as an innovative light source equipped with the latest OSRAM LED technology in a particularly compact and durable design. Thanks to the LED technology used, the product has a very low energy consumption and emits almost no heat.

The high-quality optics achieve very homogeneous illumination results when focused ± 2° with very little scattered light outside the beam cone.

Due to the excellent beam profile the spot provides cutting-edge lighting performance.

The minimum required supply voltage of 10-18 V DC (optionally 90-240 V AC) is particularly advantageous for use in mobile applications. The housing with IP protection class 67 is pressure-tight and seawater-resistant and withstands short-term flooding.

Product Features

- Efficient light source with low power consumption and low heat emission
- No need to replace the light source during product life
- Reliable IP67 enclosure with waterproof drying cartridge
- Optics focusable
- Compact design with high range
- No glare outside the illuminated area
- Fast switchable light source for the exchange or transmission of optical codes

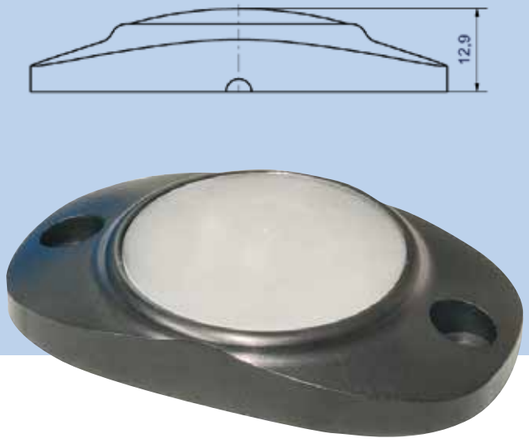
Applications

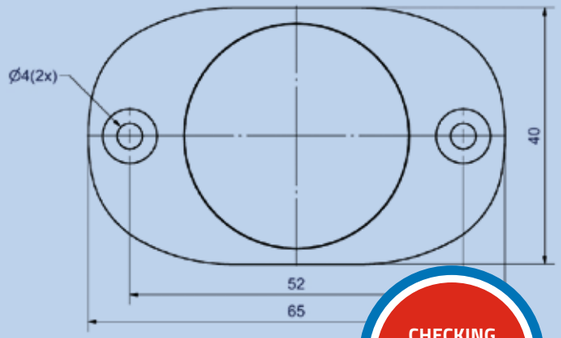
- Searchlight for SAR missions
- Well-defined spot lighting for long distance illumination
- Navigational aid
- Transmission of light signals and Morse code

Important Technical Details

Voltage	10-18 V DC or 90-240 V AC
Average Power Consumption	200 W
Color Temperature	6.000 K
Light Power	12.000 lm
Range	2.500 m
Emission Angle	± 2°
Operating Temperature	-40°C - +55°C
Protection Class	IP 67
Durability	>20.000 h
Weight	12 kg

UV-LED DOCUMENTCHECK





CHECKING DOKUMENTS AT 365 NM

UV LED LIGHT SOURCE

for document verification on the move

This powerful UV light source has been developed for mobile document validation. The wavelength of 365 nm is used to excite all luminescent and fluorescent materials of the hidden safety features.

The high-quality metal housing is used as heatsink for the high-power LED. The integrated electronics also have a temperature monitoring system in order to prevent overheating when being operated in summertime. The light source window is designed as a diffuser to illuminate an area equivalent to A5 at distances typical for a glove box.

Furthermore, the diffuser in the window reduces the beam quality of the LED to eliminate the risk of refocusing reflections.

Nevertheless, it should be pointed out that the light source must be operated in such a way that nobody can look directly into the light source.

Therefore, mounting the device in the glove box with the beam pointing downwards is ideal, both for the safety of the users and for providing optimal contrast when viewing the documents, since the glove compartment provides additional protection from stray light.

Product Features

- High optical performance
- Very compact
- Bipolar connection of the supply voltage, protected reverse polarity

Applications

- Validation of documents and bills in police service vehicles
- Designed to be installed in car glove box

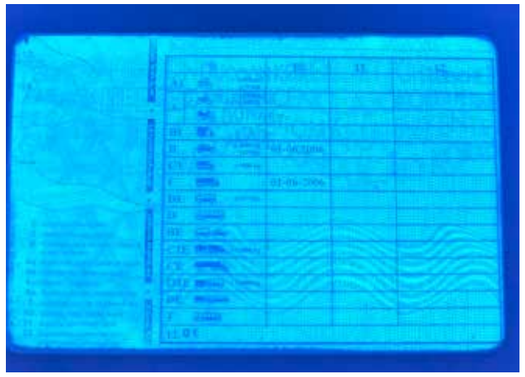
Technical Details

Optical Output	ca. 800 mW
Wavelength	365 nm
Voltage	9-15 VDC
Power Consumption at 20 °C	3 W
Temperature Control of UV-LED	at a housing temperature of about 50 °C the output is throttled

▷ Bank Note Testing

▷ Validation of Documents

▷ Original



▷ Falsification

The standard DIN EN 62471 is fulfilled.

OPTOPRECISION - WE CREATE SOLUTIONS FOR YOUR SURVEILLANCE TASKS

The demand for integrated, reliable security concepts and technologies has risen sharply in recent years. Our strength is to create the best possible visual conditions at any time of day or night and in any weather condition.

As a manufacturer of LED and laser light sources as well as complex integrated monitoring systems, we specialize in customizing, extending and integrating various system components to solve a wide variety of challenges encountered by our customers.

For many years, we have worked closely with the world's leading manufacturers in the field of camera and video technology, optics, night vision and security technology and therefore know the strengths and limitations of the hardware and software components available on the market for a wide range of tasks.

As specialist in this field, we are happy to advise you during the acquisition of further system components or develop with you a system from scratch that is optimally tailored to your area of application and your requirements.

INNOVATIVE PRODUCTS FOR THE BEST SURVEILLANCE RESULTS

Here is a small selection of companies whose products have proven themselves in our systems for many years:

neovo
Allied Vision
artec technologies
BOSCH
FLIR
FUJIFILM
Ikegami
JENOPTIK
Kowa
OPGAL Beyond the Visible
OSRAM
Raptor photonics
RICOH
SONY
ximea

NOTES

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