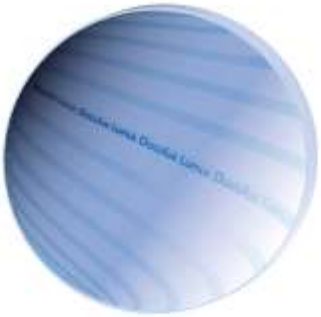


Doculus Lumus®

Technical Specification

Last updated September 20th, 2024

Doculus Lumus® - See the Truth Inside

Mobile Document Checking Device

Doculus Lumus® is a robust mobile document checking device, developed to examine passports, ID cards, visa documents, banknotes and driving licenses as well as other official documents, signatures and seals. It only takes 30 seconds to examine a document and to determine whether a falsification is at hand. Alterations become visible through using the exceptional combination of light and optical features.

Doculus Lumus® - Standard Features

ATTRIBUTES	FIELD OF USE
15x/22x Magnification	Read micro and nano text through a high-quality glass lens system. Only one main lens system to examine the detection area of a document in all different wavelengths.
21 mm/15 mm Lens Diameter	Largest possible field of view for excellent achromatic document examination.
Robust Housing: Drop-proof 1,5 m	Test it and let it drop, step on it, play football with it… 😉
White Incident Light: 4 LEDs	View security printings homogenously in bright light.
White Torchlight: 4 LEDs	Check watermarks, check documents on a bright, sunny day or at night as a torch.
White Rotating Incident Light: 4 LEDs for manual/automatic rotation	Enlighten OVDs, holograms, identigrams and moving Kinegrams. Use it similar to coaxial light.
White Rotating Oblique Light: 8 LEDs for manual/automatic rotation	Experience 3D visualisation of embossed printings, laser engravings and especially document manipulations.
UV Light 365 nm: 4 extra strong LEDs	View printings in UV 365 nm, homogenous bright illumination also on a sunny day.
Left-/Right-handed mode	Use Incident Light on your thumb of choice to operate the device with just one hand.
Steady Light Mode	No need to keep pressing buttons during checking. Perfect for Photo/Video Documentation via Smartphones and webcams.

Only with Doculus Lumus®

Look for this symbol on the next pages to learn about all unique features you **only** get with Doculus Lumus®.

Colours & Logo
Blue, grey, orange, red, lime, violet, magenta, olive, sand incl. logo option

Lens Diameter
View nanotext with the large 20 mm diameter lens already at 15x magnification

Electronic control (2 patents)
Low energy consumption to operate many months, LEDs keep their brightness even at low energy

Individualise your Doculus Lumus®
Configure to your specific needs:

Option FUV – Front UV Torch 365 nm to view an entire passport page

Option RFID – RFID ICAO Quick Check to determine ICAO & ISO 14443 Type A/B

Option AS – IR Laser 980 nm for Anti-Stokes particles with slight background light for orientation

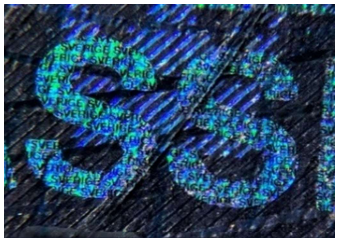
Option IR – IR LED 870 nm IR active ink visible in combination with a smartphone

Option UVC or UVB/C – 4 UV LEDs for 254 nm and 313 nm features | switch with only one button

Option LI – Multiple energy sources | use built-in Lithium-Ion AC (Micro-USB charging) or switch to AAA batteries or rechargeables

Technical Specification

Only with Doculus Lumus®

Terminology	Technical Description
Magnification and Lens System 	Doculus Lumus® is available with true 15x and 22x magnification. The built-in high-quality glass lens system is supplied by one of the three largest global suppliers in this discipline, with achromatic, true-colour and distortion-free quality glass lenses. An excellent magnifier for reading micro and nano text.
Diameter 	2,1 cm / 1,5 cm inspection diameter Doculus Lumus has the world's largest lens diameters available on the market with 15x magnification (21 mm) and 22x magnification (15 mm) for mobile devices. It is possible to read nano text in several passports and ID documents, already with 15x magnification.
Robustness 	Robust housing: Doculus Lumus® is drop-proof from a height of 1.5 meters (tested on concrete) without any functional damages. When dropped, the batteries might fall out due to the impact. Simply insert them back in the device and keep working. The device housing and electronic parts stay intact.
Electronic control 	Low energy consumption: In the frontliner edition, when using 2 AAA batteries, the operating time is approx. 3-5 months, when used in 2 shifts. All LEDs maintain the same brightness even at low battery level. 2 patents confirmed in Austria, Germany, and the U.S. No extra on / off button is required with the Doculus Lumus®. If a button is clicked the light will activate. Doculus Lumus® is normally switched off and as soon as a button is pressed, the desired light or function is activated.
Accessibility 	Doculus Lumus has 4 recessed buttons, that are large enough to be pressed while wearing gloves. For easy accessibility, the buttons carry tactile symbols. Through the recessed buttons, Doculus Lumus cannot be switched on accidentally during daily use. If a button is accidentally pressed (in a bag or pocket), the LEDs are automatically switched off after 1 minute to save energy.

4x Incident LED lights  	4x LEDs white incident light to examine micro and nano text. Additional function: Automatic or manual rotating incident light to the left or right. The rotating incident light enables the examination of identigrams and holograms. (see next column for more details) Steady light activates at 3 clicks for 1 minute --> for photo and video documentation with a smartphone.
Rotating Incident Light (similar to coaxial light) 	Automatic or manual rotating incident light to the left or right. The rotating incident light (similar to coaxial light) enables the examination of identigrams and holograms through the main lens of Doculus Lumus under magnification. Switch easily (one button click) between rotating incident and oblique light to examine OVIs under the different light angles through the main lens of Doculus Lumus. Steady light activates at 3 clicks for 1 minute --> for photo and video documentation with a smartphone
Torchlight mode 	Torchlight mode with white LEDs: use as a torch or when examining documents on a very sunny day. With this function, the 4x Incident Light LEDs get a boost. Steady light activates with 3 clicks for 1 minute -> for photo and video documentation with a smartphone.
8x Rotating Oblique light LED  	8x LEDs are implemented for automatic and manually rotating Oblique Light to the left or right. Ideally suited for 3D realistic viewing of OVDs, OVIs, embossing, imprints, paper manipulations, holograms and moving Kinegrams with many different features at different angles. Switch easily (one button click) between rotating incident and oblique light to examine OVIs under the different light angles through the main lens of Doculus Lumus. Using electronic control, all LEDs maintain the same brightness even at low battery level. (Patent)

4x UV LED lights 365 nm

4x strong UV-LEDs 365 nm, with magnification for detection of UV micro and nano security printings. Steady light activates at 3 clicks for 1 minute --> for photo and video documentation with a smartphone.

Using electronic control, all LEDs maintain the same brightness even at low battery levels. (Patented)

Left-/Right-handed Mode

By default, the key assignment of the device is designed for right-handers. In many cases, left-handed people want to operate the incident light, UV and also the torch mode with their thumb. This is possible by simply mirroring all the functions on the buttons for the preferred handling of the device.

Switch mode:
Switching between right-handed and left-handed mode is done by briefly pressing all 4 buttons simultaneously. After the green and red LEDs light up at the same time, take the device in the respective hand.

For left-handed users: If you want to have the incident light on the left thumb, hold down the oblique light button  until all lights go out.

For right-handed users: If you want to have the incident light on the right thumb, hold down the incident light button  until all lights go out.

(For Doculus Lumus with IR laser, this mode is deactivated for safety reasons).

Steady Light mode for documentation purpose

With this mode the desired light stays on for 1 minute to give the user time to examine the document and photo and video document what is seen.

Doculus Lumus has a flat design so that a smartphone can be placed on it wobble-free. For additional stability, use the Smartphone Clip (See page 10 “Accessories). The steady light mode is ideal for photo or video documentation purposes with a smartphone or webcam.

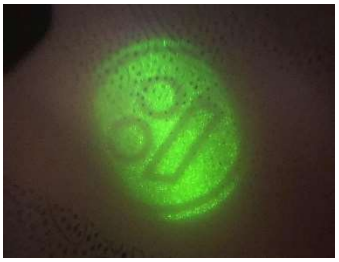
The unit switches itself off after 1 minute to save energy.

The steady light mode is available for all light functions, except Option AS for safety reasons.

Selectable Options

Individualise your Doculus Lumus® for frontline, secondline or thirdline.

Only with Doculus Lumus®

Individualize your Doculus Lumus®	Doculus Lumus® can be individualized to your needs with 7 individual options and 9 colours. Each option can be used with standard AAA batteries as well as in combination with an integrated Lithium-Ion accumulator (option LI) using multiple energy sources in one device. Depending on the version of your current Doculus Lumus®, you can even upgrade your existing device with additional options.
Option FUV Front UV Torch (365 nm) 	The integrated front UV torch allows to view an entire passport page at a glance with UV 365 nm. Steady light mode can be activated for 1 minute.
Option RFID ICAO & ISO 14443-4 Type A/B Quick Check 	Ideal option for frontliners who need to quickly identify counterfeit e-documents with destroyed RFID chips. The RFID ICAO Quick Check enables a fast determination of RFID transponders in passports or ID cards. The RFID transponder is not unlocked at crypto level. The existing file structure is used to detect a passport or ID card transponder, if it is ISO 14443-4 type A or type B and whether the file structure is ICAO conform.
Option AS IR laser 980 nm for Anti-Stokes particles with slight background light  	The certified class 3R invisible infrared laser allows to view special Anti-Stokes particles in security printings. The spot size is approximately 2 mm and the colours seen range mostly from green to at times orange. Examination through one main lens The laser is seen through Doculus Lumus®' singular viewing field. This enables the user to view the Anti Stokes particles without having to move the document or device. Background light for orientation Slight background light ensures the easy navigation around the inspection area. The laser can also be used while standing up with Doculus Lumus® at an angle. Safety of other persons is granted. Examine Anti-Stokes particles with 15x and 22x magnification It is possible to examine Anti-Stokes particles with 15x and 22x magnification in detail. Examine on the move Activate the Anti-Stokes Laser even while standing and being on the move. Doculus Lumus® does not need to be placed on a desk or other flat surface.

Safety precaution

Through the constant red LED on the lid of the device you always know when the IR laser is active. For safety reasons there is no steady light mode. The laser beam is divergent to increase safety.

IR / UVC Filter: Radiation protection

In the Doculus Lumus® versions with IR laser / UVC, a filter glass is implemented to protect the user from harmful rays to the skin and eyes. Please find the details in the user manual.

Option IR

IR-LED for 830-925 nm and IR2

By using an IR LED (category 1M), security features in the range of 830 to 925 nm can be made optimally visible.

Thanks to the permanently red LED on the cover, you always know when the IR LED, which is invisible to the naked eye, is active.
The details only become visible through your smartphone camera (possible with iPhones newer than iPhone 7, Samsung and Huawei devices) or standard webcams.

The steady light is activated by clicking 3 times (RFID light button) for 1 minute -> for photo and video documentation with a smartphone.

Option UVC

4x LEDs UVC for 254 nm

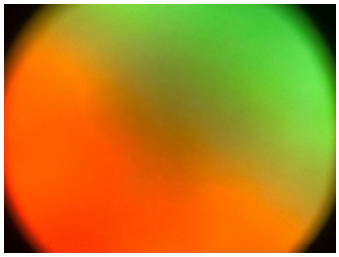
The option UVC equips your Doculus Lumus® with **4x UVC LEDs** to view security printings at 254 nm. Compared to the commonly used UVC ring tubes, these LEDs offer the advantage that they provide improved illumination and are not damaged when the device has been dropped (drop-proof 1,5 m).

IR / UVC Filter: Radiation protection

In the Doculus Lumus® version with IR laser / UVC, a filter glass is implemented to protect the user from harmful rays to the skin and eyes. Please find the details in the user manual.

Option UVB/C

2x LEDs UVC for 254 nm and
2x LEDs UVB for 313 nm



The option UVB/C is an upgrade to the regular UVC option. It equips your Doculus Lumus® with **2x UVC LEDs** to view security printings at 254 nm as well as **2x UVB LEDs** to inspect 313 nm printings. They are activated simultaneously, creating a gradient to view bi- and tri-fluo colours. This option also enables to view UVC security features on polycarbonate better and more brightly through the additional UVB LEDs.
Compared to the commonly used UV ring tubes, our LEDs offer the advantage of higher illumination and that they are very robust to withstand also when the device is being dropped (drop-proof 1,5 m).

IR / UVC Filter: Radiation protection

In the Doculus Lumus® version with IR laser / UVC, a filter glass is implemented to protect the user from harmful rays to the skin and eyes. Please find the details in the user manual.

Multiple energy sources in one device:

Option LI
Use integrated Lithium-Ion accumulator with the innovative battery change mode

Use the integrated Lithium-Ion battery and continue with 2 standard AAA batteries when the accumulator runs low.
Doculus Lumus® versions with Lithium-Ion battery have an operation time of approx. 1 month in 2 shifts. If this optional feature is chosen, the device still also works with 2 AAA batteries or rechargeables. As soon as batteries are inserted, the power consumption of the Doculus Lumus automatically switches to battery mode. (**Patented**)

Multiple energy sources in one unit for long operation time in the field:

1) **Standard AAA batteries:** The operating time of the included 2 AAA batteries is estimated at 2-3 months with 2-shift operation.* Included in every Doculus Lumus product package.

2) **Rechargeable AAA batteries (Additional accessories):** When using 2 AAA Panasonic eneloop batteries, the operating time is approx. 3-5 months, when used in 2 shifts. Charger included.

3) **With integrated Li-ion accumulator:** The operating time with LI accumulator is 1 month in 2 shifts. The unit also works with 2 AAA batteries or rechargeable batteries if the accumulator is empty.
Use multiple energy sources during operation and never run out of energy!
If the accumulator is out of energy, insert batteries (2x standard or rechargeable AAA), then the Doculus Lumus device automatically switches to battery operation (patented!). Simply charge the device when back at the office and keep the spare batteries in the belt bag. USB-C charging cable included.

*At average use, previously experienced operation time

Colours

Choose your individual colour for Doculus Lumus®. Upon request it is also possible to choose your own RAL colour, i.e. to match your corporate or organizational colours. It is also possible to position a logo on the lid of the device if desired.

Available colours: blue, lime, grey, red, magenta, orange, violet, olive, sand

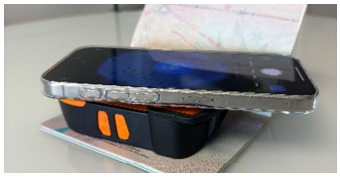
Individual Logo

Individualise your devices by placing the desired logo centred on the Doculus Lumus® lid, i.e. your corporate or organization logo.

Please contact our sales team for an offer.

Included Accessories

for your Doculus Lumus®

2 pcs. AAA-Batteries	Operating time of the enclosed 2-pack AAA batteries is for a frontliner edition at least 2-3 months, when used in 2 shifts.
Microfibre cloth	Keep your lens clean at any time with the included microfibre cloth.
Hand strap	Safely secure Doculus Lumus® with the included, adjustable handstrap. If prefered, a neck strap with safety opening mechanism can be provided instead.
Recommendation card	Share your experience of Doculus Lumus® with others.
Quick Guide	The Quick Guide is a short introduction on how to use your Doculus Lumus®. It visualizes all functionalities briefly and how to activate them. It is included in every package in English, other languages can be downloaded as PDF from our website, printed version on request.
USB cable for **Option** LI	When purchasing a Doculus Lumus® with the Option LI (integrated Lithium-Ion battery), a USB cable type USB-C is included.
Smartphone Clip  	The Smartphone Clip is a simple click-on tool, to stabilise any smartphone for photo and video documentation. It can be left on and the device will still fit in the bag.
Visa Sticker VDS Specimen for Training 	The specially designed Visa Sticker for training purposes is part of the Doculus Lumus set. The sticker is personalized with a Specimen person and shows all relevant security features found in ID documents. Explanatory brochure available. Material and colors: 248 g/m2 composite material VS: 3 color iris print + 1 color iris print (invisible) + UV Bi FLUO + 5 colors + hologram embossing

Additional Accessories

for your Doculus Lumus®

Belt Bag 	Specially designed belt bag for Doculus Lumus® (water-repellent, robust bag made of nylon with **snap button** or **velcro fasteners**, main device compartment, integrated inner compartment for a microfiber cloth, side compartment for a battery set, belt attachment with adaptable velcro fastener, loop for carabiner). The bag can be attached to a tactical belt with a hook and is compatible with the MOLLE system. The bag carries an NFC transponder. When read with a Smartphone, the user gets directed to our Help-site with short video links, our Quick Guides in all 15 available languages for download as well as a helpdesk e-mail and telephone number. Special adaptations can be made on request.
Rechargeable AAA batteries eneloop with charger (4-pack)	Panasonic eneloop, Ready-to-Use Ni-MH rechargeable battery, AAA Micro, pack of 4, min. 750 mAh, 2100 charge cycles, low self-discharge. Within the set an eneloop AAA round cell **charger** for 4x rechargeable batteries NiMH Micro (AAA), Mignon (AA) is included.
Doculamp 365 nm 	The DOCULAMP 365 is a UV torch at 365 nm with homogenous illumination. The specialized professional projector type combined optical lens enables the torch to achieve uniform projection and ultra-wide lighting range, without any interference of stray light. The electronic control ensures constant brightness, without flicker. USB-C Charger, Belt Bag and Handstrap included in the set.
User Manual	The user manual can be downloaded in multiple languages from our homepage as a PDF file for free. Printed user manual booklets and translations on request.

General Specifications
of Doculus Lumus®

Only with Doculus Lumus®

Market penetration	The use of Doculus Lumus® is possible worldwide. In less than 30 seconds, it is possible to identify forgeries of passports, ID cards or ID cards or banknotes and then document the area with a photo on your smartphone. It is a mobile document checking device that can always be carried in a shirt or trouser pocket or in the specially designed belt bag. Due to its robust design, it supports the hard everyday work of the emergency forces on the motorway, in the train or at the airport in the best possible way.
Market situation	Doculus Lumus® has been sold as a series product worldwide since 2015. To date, several thousand devices are in use worldwide at borders, airports, criminal investigation offices, customs, prisons and in various ministries and embassies.
Corporate Social Responsibility	Social commitment is a must for us. Doculus Lumus® has been produced locally since 2015 in a nearby series workshop at the company Team Styria GmbH, which employs more than 75% integrative people with various disabilities.
Made in Austria	With a value added of more than 80%, Doculus Lumus® is a genuine Made in Austria product. We rely on local production and procurement to strengthen our local business location. This enables us to produce just-in-time and just-in-sequence and to implement individual customer requirements.
Technical benchmark	By working closely with document experts from all over the world, Doculus Lumus GmbH has been able to incorporate the most important and useful functions for the rapid detection of forged documents into a handy tool. Using state-of-the-art mechatronics for intelligent energy saving and user safety, two patents have already been approved. The 1st patent on the electronic control ensures the constant brightness of the LEDs, even if the batteries/accumulator runs low on energy. The 2nd patent refers to the automatic change of the energy supply from lithium-ion battery to the standard AAA batteries if inserted for devices with the LI option. This ensures that the user (1) can work with the same brightness of light until the device runs out of energy and (2) that a second energy supply allows to work longer and without interruptions when out in the field.
No extra switch on / off	No extra on / off button is necessary with the Doculus Lumus®. The specially developed electronic switch-off mechanism switches the device on as soon as buttons are pressed. If the button is let go or after 1-minute steady light, the device switches off automatically to save energy. Doculus Lumus has recessed buttons and is designed so that the device cannot be accidentally switched on during daily use and run out of energy. If a button is activated by mistake (in the suitcase or in a pocket), the LEDs are also switched off after 1 minute to save energy.

Operation time & Multiple energy sources	Multiple energy sources in one unit for long operation time in the field: 1) **Standard AAA batteries:** The operating time of the included 2 AAA batteries is estimated at 2-3 months with 2-shift operation.* 2) **Rechargeable AAA batteries (Additional accessories):** When using 2 AAA Panasonic eneloop batteries, the operating time is approx. 3-5 months, when used in 2 shifts. Charger included. 3) **With integrated Li-ion battery:** The operating time with battery is 1 month in 2 shifts. The unit still works with 2 AAA batteries or rechargeable batteries. Use multiple energy sources during operation! As soon as AAA batteries are inserted, the Doculus Lumus LI device automatically switches to battery operation. Simply charge the device when back at the office and keep the spare batteries in the belt bag. A USB-C cable is included. *At average use, previously experienced operation time
Handling	With only 4 buttons, Doculus Lumus® is easy to operate, even with one hand. The functions are placed intuitive, and the device can be used immediately without further training. If wished for, a short session for tips and tricks is available free of charge. The Quick Guide provides a quick familiarisation/reminder of the different functionalities. In the enclosed or downloadable operating instructions, each function and its use can be easily looked up. By switching to left-handed mode, left-handers can also operate this device very easily with one hand and always have the white incident light – most used function - available on their preferred thumb.
Further Training	The Doculus Lumus Team provides a short training session on the device's functions and tips and tricks free of charge. The training can be held via MS Team or in-person. For in-person trainings, travel expenses are charged separately. For training on document security features and/or the document checking, we have a network of globally known document training centres who we can connect you with or offer trainings as a bundle together with the Doculus Lumus devices. For further information, please contact our team under sales@doculuslumus.com.
Climatic conditions	Doculus Lumus® has been used day and night in all regions of the world since 2015, whether on the coast of Norway, throughout Europe, Canada, USA, Tahiti, Iceland, South Korea, India, Japan, Australia, Kenya, Oman all the way to the desert of Iraq.
Environmental conditions	Tested at: -20 to +80 °C (approx. -4 to 176 F) Humidity: ≤ 80 % relative humidity, non-condensing Recommended temperature: -20 bis +55 °C (ca. 0 bis 130 °F)

Splash-proof	Doculus Lumus® has been designed to be protected against dust and splash water after IP54 standard. The special construction of the housing and the lens carrier are equipped with 2 sealing rings that shield the optical from the electronic area. It is not completely waterproof and should not drown in e.g. sugared coffee 😊
Robust housing	The Doculus Lumus® housing is made of 2 highly durable plastics. For hygienic reasons, no sticky soft touch surface. The design has been chosen so that a user cannot unintentionally destroy the lens or the internal electronics. (not waterproof, no IP76) The device is also quite resistant against dust. The housing design shields the lens from external lighting. Doculus Lumus is drop-proof at 1.5 m heights. (Tested on concrete)
Certifications	Doculus Lumus® has certifications for Europe CE, FCC for USA, as well as for Canada, Australia and New Zealand. Our Manufacturing is certified under ISO 9001 in Graz (Austria) and underlines their social responsibilities by employing 70% people with disabilities.
Dioptric compensation 	Note on the correct use of Doculus Lumus®: At a 15x/22x magnification, it is technically no longer a magnifying glass, as you are already in the microscopic range. For this, it is necessary to bring the eye directly or very close to the lens. The quality glass lens system in the Doculus Lumus® makes it possible to compensate for different diopter strengths. A distance ring is fitted as standard and adjusted so that the visual acuity is optimally set for all corrected (correction by glasses or contact lenses) and uncorrected users (between -4 and +4 dioptres). A survey with test persons with different dioptric strengths from -4 (short-sightedness) to +4 (long-sightedness) proves that additional dioptric compensation with the device and the quality glass lens system used should only be used as a support from a dioptric strength of more than 4 diopters of short-sightedness or long-sightedness. The detailed results of the survey with different visual acuities can be provided on request. Alternatively, 2 additional distance rings for refined visual acuity adjustment can be fitted for strongly farsighted users. Included upon request. For the insertion of the distance rings, please refer to the User Manual.
Illuminance measurement	Measuring device: Digital Lux-Meter RO-1330 Test conditions: CAMPUS 02 laboratory, lights switched off, darkened with closed blinds. Measurements White Incident Light: 3820 lx White Torchlight: 7950 lx White Oblique light (1 LED): 800 lx UV 365: 400 lx

	UV 254+313: 37 lx (measurement not meaningful because measuring device sensor is made of plastic) AS laser: 940 lx (measurement not meaningful due to laser dot) Front UV 365 nm: - Distance 0 mm (direct contact): 1830 lx - Distance 45 mm (ID card completely evenly illuminated): 1200 lx - Distance 65 mm (passport side completely evenly illuminated): 590 lx
Warranty	Doculus Lumus GmbH grants a warranty of 24 months after the date of purchase on material and production of Doculus Lumus®. After the warranty time has expired, there is a refreshment service offered for Doculus Lumus®! We offer extended warranty for 0,20 € / year per purchased device. This includes cleaning, software updates as well as, if necessary, the repair of the device and a colour cover exchange. In the case of a malfunction or non-function of Doculus Lumus®, please contact your distributor or the manufacturer Doculus Lumus GmbH directly at: sales@doculuslumus.com It is recommended that Doculus Lumus®, as well as any other device made of plastic, should not be exposed to temperatures above 80 degrees (e.g. a dashboard in a car exposed to direct sunlight for a longer period of time in summer).
Service and maintenance "From old to new"	There is a refreshment service available for Doculus Lumus®. This includes cleaning, software updates and, if necessary, repairing the unit and replacement of the cover. It is also possible to upgrade your device with certain new options, depending on the version you currently have. Compatibility assessment upon request.
Customs tariff number	Set Doculus Lumus® with bag Customs tariff number: 9031499000 Declaration of Origin or CE certificate on request.
Size	Doculus Lumus® has the following size and thus fits in any trouser or shirt pocket: 108 mm x 63 mm x 28 mm
Weight	105 g weight of a Doculus Lumus® without batteries 128 g weight of a ready-to-use Doculus Lumus® incl. batteries and wrist strap 265 g weight of a complete Doculus Lumus® with bag

For any remaining questions please contact us under: sales@doculuslumus.com