

# DESKO ICON Scanner®

## Technical Specification

ICON Scanner® Short Cover



ICON Scanner® Long Cover



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## Glossary

- API Application programming interface
- DPI Dots per inch
- ICAO International Civil Aviation Organization
- IR Infrared
- ISO International Organization for Standardization
- LED Light emitting diode
- MRZ Machine readable zone/document code line
- NFC Near field communication
- OCR Optical character recognition
- RFID Radio-frequency identification
- SDK Software development kit
- USB Universal Serial Bus
- UV Ultraviolet light
- LPS Low Power Supply

# 1 Security Advice, Handling Rules & Package Content

## 1.1 Security Advice

The DESKO ICON Scanner<sup>®</sup> family contains UV-A and IR light sources which are classified as CLASS 1M LED PRODUCT according to IEC 60825-1.



That means that the light sources radiate intense invisible UV-A and IR light during the scan process. So consequently precautions must be taken to prevent looking directly at the UV-A and IR light.

*NOTE: UV-A is an optional light source and might not be installed in every unit.*

## 1.2 Handling the DESKO ICON Scanner<sup>®</sup>

The DESKO ICON Scanner<sup>®</sup> is designed to work in a rough environment and withstand light shocks. Nevertheless DESKO recommends to following certain handling rules such as:

- Do not drop or hit the device
- Prevent the device from heavy vibrations
- The device is not waterproof, prevent the device from getting wet
- Prevent the device from heavy dust
- Do not lift the DESKO ICON Scanner<sup>®</sup> by pulling on its cover

## 1.3 Package Content

### 1.3.1 Standard Version

- DESKO ICON Scanner<sup>®</sup>
- Power supply (5.0V DC), different country versions
- USB 2.0 cable
- Quick Installation Guide with the link and log-in data for the DESKO ICON Scanner<sup>®</sup> download area

### 1.3.2 OEM Version

- DESKO ICON Scanner<sup>®</sup>
- Quick Installation Guide with the Web link and log-in data for the DESKO ICON Scanner<sup>®</sup> download area

## 2 Introduction

*This guide describes the standard use of the DESKO ICON Scanner<sup>®</sup> with all features and hardware configurations. The delivered features and hardware configurations depends on the ordered configuration. Detailed information on the respective configuration can be found in the Quick Installation Guide shipped with the device.*

The DESKO ICON Scanner<sup>®</sup> is a full page scanner designed to be used in self-service and agent operated environments. As a full page scanning device that supports OCR and RFID reading (depending on hardware configuration).

Depending on the hardware configuration, the device supports the reading of:

- Machine readable zone of OCR documents according to ISO/IEC 7501-1 and ICAO 9303 (e.g. ID cards, passports and visas).
- RFID documents according to ISO 14443 (A/B), ISO 7816 (incl. US passport), ICAO 9303 as well as full NFC support.

To achieve best performance and image quality it is important to prevent indirect sunlight hitting the reading window. Therefore the DESKO ICON Scanner® provides two cover options:

- 1) DESKO ICON Scanner® with Long Cover for desktop use (Pic.2.1)
- 2) DESKO ICON Scanner® with Short Cover for integration (Pic.2.3)



*Pic.2.1: Front view of DESKO ICON Scanner®  
With long cover*



*Pic 2.2: Back view of DESKO ICON Scanner®  
Standard with short or long cover*



*Pic.2.3: Front view of DESKO ICON Scanner®  
With short cover*



*Pic 2.4: Back view of DESKO ICON Scanner® OEM  
With short cover*

## 3 Specification

### 3.1 Technical Features of the DESKO ICON Scanner®

- 5 Megapixel high quality image sensor (Resolution up to 500 dpi)
- Visible, IR and UV-A light source
- Dual RFID antenna with full NFC support

### 3.2 Key Features of the DESKO ICON Scanner®

The DESKO ICON Scanner® focuses on passport and ID card reading in order to achieve the quickest read results and image capture while maintaining a high resolution scan quality.

#### 3.2.1 OCR Recognition

The integrated ICAO document reader is capable of reading and decoding OCR data with a read rate of at least 99% from the following documents:

- Passport data from machine readable passports and identification cards according to ISO/IEC 7501-1 and ICAO 9303

- Personal OCR encoded travel documents e.g. Visa, Crew Member Cards according to ICAO 9303

*(Additional document types can be supported upon request.)*

MRZ reading time is in average around 0.5 seconds for ICAO 9303 compliant documents. OCR data output is in standard readable format, depending on PC system and application.

### **3.2.2 RFID & NFC Reading**

The integrated RFID Module is a dual antenna design that is especially designed for passport reading. The RFID module is able to read RFID documents according to ISO 14443 (A/B), ISO 7816 (incl. US passport), ICAO 9303.

RFID e-passport reading for BAC is in average around 1.5 seconds, depending on PC system and application.

Generally the type of e-passport/e-ID can also influence RFID reading performance. This is due to different chip sets and OS in various e-passport/e-ID document types. RFID e-passport reading speed may therefore vary from document to document.

### 3.2.3 Passport Image Scanning

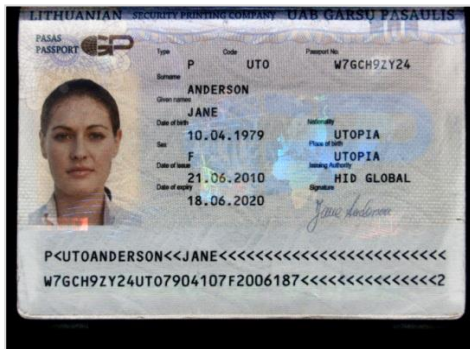
The DESKO ICON Scanner® scans documents with three different light sources (VIS, IR, UV-A) and with the DESKO software you can capture images in JPEG, BMP, PNG or RAW format.

The image resolution of the DESKO ICON Scanner® is scalable up to 500 DPI. Scanned images are glare reduced. Optional elimination of extraneous light is available.

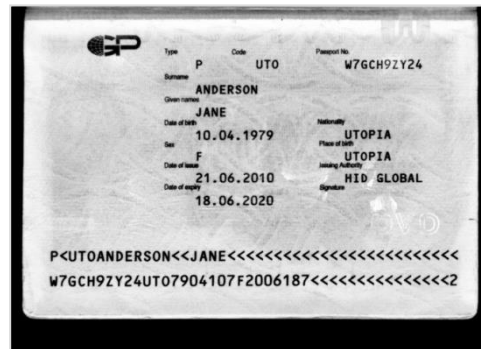
Scanning time for all three images is in average around 1.5 seconds, depending on image resolution, PC system and application. Scanning time may vary with older PC systems or higher image resolutions.

Description of the used light sources (all light sources are LED light sources):

Light source	Description	Wavelength	Comment
VIS	Visible light	5600 K	
IR	Near infrared light	850 nm	
UV-A	Near ultraviolet light	365 nm	optional



Visible Light



Near Infrared Light



Ultra Violet Light



### **3.2.4 LED**

The DESKO ICON Scanner<sup>®</sup> has an integrated multicolor LED on the front for visible user feedback. The multicolor LED can be controlled over the DESKO Scan API.

### **3.2.5 Buzzer**

An internal buzzer is available for audible user feedback. The buzzer volume can be controlled and adjusted over the DESKO Scan API. The DESKO ICON Scanner<sup>®</sup> also supports an external buzzer interface.

## 4 Installation and Setup

### 4.1 Software Setup

Information about the software (including documentation), driver and SDK can be found in the DESKO download area. The link and log-in data for the download area can be found in the Quick Installation Guide. Alternatively you can contact [support@desko.com](mailto:support@desko.com).

### 4.2 Hardware Setup

#### 4.2.1 ICON Scanner®

##### Step 1 – Power Connection

Connect the DESKO ICON Scanner® to the power plug (orange box). Only use the provided power supply!



##### Step 2 – Signal Connection

Connect the DESKO ICON Scanner® via the provided USB cable with your PC (blue box).



##### Step 3 – Turning on the DESKO ICON Scanner®

After you have connected the DESKO ICON Scanner®, turn the device on by switching the power switch (green box).



#### 4.2.2 ICON Scanner® OEM

##### Step 1 – Power and USB Connection

Connect the DESKO ICON Scanner® OEM to the power and USB plug (orange box).

*NOTE: The plug has a strain relief. To release the plug from the socket, you have to push the locking hook down.*



## 5 Software Integration

For software integration, DESKO provides several APIs to control the DESKO ICON Scanner<sup>®</sup> via a USB host connection. Respective software development kits (SDK) provide runtime libraries, documentation and samples for a number of platforms and development environments.

*(For further information please contact [support@desko.com](mailto:support@desko.com).)*

### 5.1 DESKO Scan API

The DESKO Scan API features basic device control:

- OCR reading on the machine readable zone (MRZ)
- Document placement and removal detection
- Host-triggered image capturing with JPEG, BMP, PNG or RAW data output
- Feedback control (buzzer, LED)
- Connection state sensing
- Maintenance (firmware update, state information)
- Logging and debugging

The SDK provides runtime DLLs and samples tested for the following environments:

- Windows XP, Vista, 7, 8 and 8.1 – both 32 bit and 64 bit
- Native C and wrappers for C++, .NET and JAVA

### 5.2 DESKO e-Pass API and PC/SC

Access on biometric passports (e-passports) can be established with the DESKO e-Pass API:

- Support for ICAO document 9303 compliant MRTDs
- Extended Access Control (EAC) as defined in TR-03110 up to version 2.10
- Supported security protocols:
  - Basic Access Control (BAC)
  - Password Authenticated Connection Establishment (PACE) with MRZ or CAN
  - Active Authentication
  - Chip Authentication (EAC 1.11, EAC 2)
  - Terminal Authentication (EAC 1.11, EAC 2)
- Inspection system PKI integration for terminal authentication:
  - Internal database with CV certificates and private keys for the IS certificates
- PKI integration for passive authentication:
  - Internal database with X509 certificates
- Binary data group and elementary file reading
- Decoding of ICAO document 9303 data groups

The e-PASS SDK provides runtime DLLs and samples tested for the following environments:

- Windows XP, Vista, 7 – both 32 bit and 64 bit (WOW64)
- Native C and wrappers for .NET and JAVA

Another generic way of accessing RFID documents is provided by the low-level PC/SC interface of the device driver.

### 5.3 Version Control

For maintenance, the device must be connected to a PC via the USB host port. Most maintenance functionality is available via the DESKO Scan API and therefore can be integrated directly into the customer application or environment. DESKO also provides dedicated tool sets, which are part of the ICON software package (DESKO Device Updater) or can be obtained from DESKO on request.

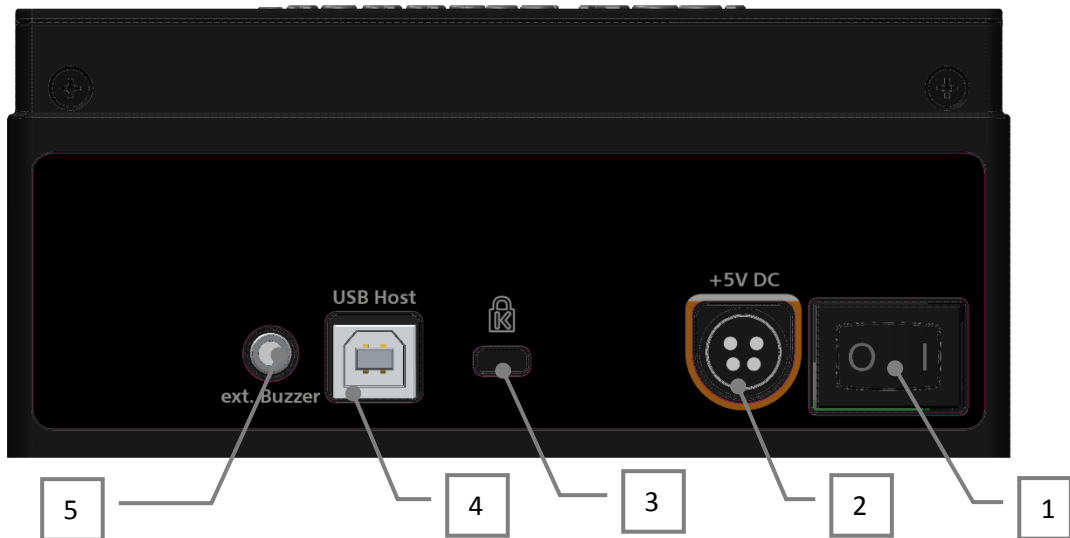
The following are common maintenance tasks:

- Read out detailed information about firmware, device or software version.
- Update the firmware.
- Set the RFID tuning (not part of the API).

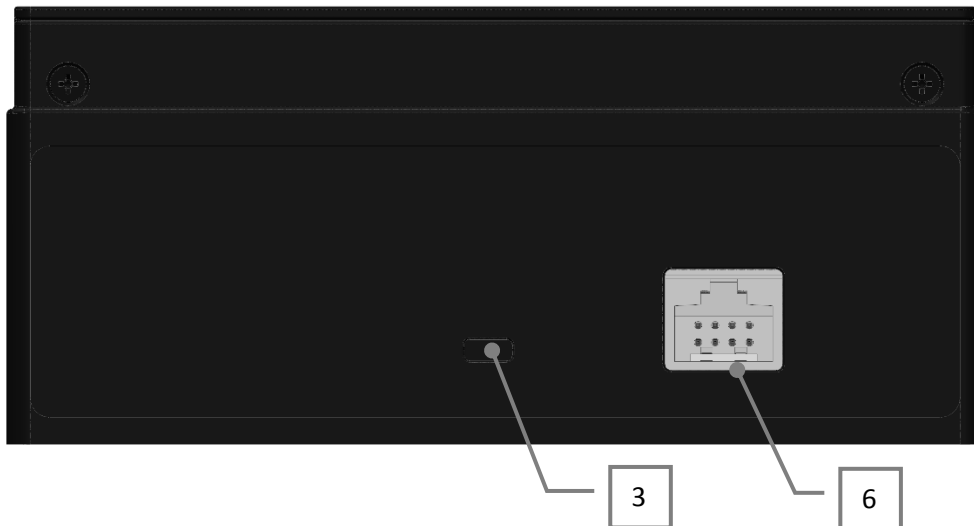
## 6 Hardware Integration

### 6.1 Connectors

The DESKO ICON Scanner® has the following connectors.



The DESKO ICON Scanner® OEM has the following connectors.



1	Power Switch	ON / OFF
2	Power Connector	5V / 2,5A
3	Kensington Lock	optional (not used)
4	USB Host	USB 2.0 Hi-Speed communication between DESKO ICON Scanner® and Host PC
5	Connector for external Buzzer	jack socket
6	Power Connector combined with USB	12V / USB 2.0 Hi-Speed

To use the DESKO ICON Scanner® it needs to be connected to the power supply and the according host interface which is the USB-Port driven by the DESKO API (see section 5.1).

**The detailed hardware integration is described in appendix A.**

## 7 Usage of the DESKO ICON Scanner®

As soon as the DESKO ICON Scanner® is connected to a PC the device is ready to read OCR and scan images from different documents.

### Scanning an ID-3 size document: (e.g. German passport)

To scan an ID-3 passport document, hold the page with the MRZ (machine readable zone) face down on the scan window and push it against the rear stop.



### Scanning an ID-1 document: (e.g. ID card with three-line MRZ)

To scan an ID-1 card, hold it flat on the center of the scan window. For MRZ reading, the respective side of the document must be facing down.



### Reading an RFID / NFC document: (e.g. e-Passport)

The DESKO ICON Scanner® is optionally equipped with two RFID antennas. The two antennas are mounted hidden around the scan window and the area around the front label. Consequently it does not matter whether the RFID chip is integrated inside the front or rear cover of the passport.

*Note: RFID passport reading may take several seconds.*



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## 8 Service

NOTE: A dirty scanning window (fingerprints, smudges or dust) may affect the scanning performance and accuracy of the device.

### 8.1 Clean Glass Window

1. Turn off the DESKO ICON Scanner<sup>®</sup>
2. Clean the glass with a soft cloth or sponge slightly moistened with a nonabrasive glass cleaner.
3. Dry the glass with a chamois or cellulose sponge to prevent spotting.

### 8.2 Clean Housing

1. Turn off the DESKO ICON Scanner<sup>®</sup>
2. Clean the housing with a soft cloth or sponge slightly moistened with a nonabrasive, solvent free cleaner.
3. Dry the housing with a chamois or cellulose sponge to prevent spotting.

## 9 Maintenance

In general, DESKO products are maintenance free. However, if there is a failure or if you require any technical assistance, contact our support team.

## 10 Warranty

### 10.1 Warranty Includes

Warranty covers product defects that occur during correct use in accordance with the handling rules as stated in paragraph 1.2.

The warranty is valid only for DESKO ICON Scanner<sup>®</sup> that are purchased new and unused.

Warranty only applies where a defect has arisen, wholly or substantially, as a result of faulty manufacture, parts or workmanship during the warranty period. Also covered are electronic failures that can be traced as manufacturing defects or electronic part failures.

### 10.2 Warranty Exclusions

The warranty does not apply where damage is caused by other factors, including without limitation:

- Normal wear and tear
- Abuse, mishandling, accident or failure to follow operating instructions
- Damage caused by heavy impact or drop
- Leaking batteries, exposure to liquid or infiltration of foreign particles
- Servicing or modification of the product other than by DESKO, their authorized service agents or, where applicable, another member of the DESKO International Service Network
- Use of the product with other accessories, attachments, product supplies, parts or devices (including batteries) that do not conform to DESKO specifications
- Shipment or other transit
- Dirt and transportation damages due to improper packing of return shipment to DESKO's repair center

DESKO ICON Scanner<sup>®</sup> returned for service and repair without any status or failure description will not be serviced under warranty conditions.

## 11 Support

Please check if all the cables are connected, the software is installed properly and the device is powered on. If this is the case and the device still does not work, then contact our DESKO support team:

Technical Support E-mail: [support@desko.de](mailto:support@desko.de) | Phone: +49 (0) 921 79279-69



## 12 Technical Overview

### 12.1 Technical Data DESKO ICON Scanner<sup>®</sup>

Supply Voltage:	5V DC +/- 5% (by a LPS unit)
Supply Current:	2,5 A max, 1,0 A typ
Storage Temperature:	-10°C to +60°C
Operating Temperature:	0°C to +45°C
Humidity:	20% to 80% (R.H. non condensing)
Special conditions:	no direct sunlight on scan window
Reliability:	MTBF = 180.000 hours (24/7 operation mode)
RF / EMI Compliance:	CE and FCC
<i>Test report available upon request.</i>	

### 12.2 Technical Data DESKO ICON Scanner<sup>®</sup> OEM Gen1.1

Supply Voltage:	12V DC +/- 5% (by a LPS unit)
Supply Current:	1,1A max, 0,5 A typ
Storage Temperature:	-10°C to +60°C
Operating Temperature:	0°C to +45°C
Humidity:	20% to 80% (R.H. non condensing)
Special conditions:	no direct sunlight on scan window
Reliability:	MTBF = 180.000 hours (24/7 operation mode)
RF / EMI Compliance:	CE and FCC
<i>Test report available upon request.</i>	

## 12.3 Dimensions

Footprint:	190 x 145,3 mm (7.5 x 5.7 inch)
<i>Detailed dimensional drawing is available upon request.</i>	
Height Cover Short:	65 mm (2,5 inch)
Height Cover Long:	90,1 mm (3,5 inch) 94,5 mm (3,7 inch) with rubber feet
Scan Window Size:	94 x 130 mm (3.7 x 5.1 inch)
Weight:	approx. 1150g (2.5lb)

## 12.4 Features of the DESKO ICON Scanner®

Scanning Window:	Scanning window glass is extra toughened glass to withstand shocks and impacts. The surface is also scratch resistant. Toughened glass is designed for professional use (anti-break) and is in accordance with most health & safety regulations.
OCR Recognition:	OCR Reader according to ISO/IEC 7501-1 and ICAO 9303, IATA Resolution 720 and recommended practice 1722e
RFID & NFC:	RFID documents according to ISO 14443 (A/B), ISO 7816 (incl. US passport), ICAO 9303 as well as full NFC support (optional)
Passport Image Scanning:	Scan documents with three different light sources (VIS = 5600 K, IR = 850 nm, UV-A = 365 nm) up to 500 dpi
Data Output / Connectors:	1 x USB Host 2.0, 1 x Speaker (external/optional)
User Feedback:	buzzer, 1x power LED, 1x status multicolor LED

## 12.5 Regulation information

This device complies with Part 15 of the FCC Rules.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

**CAUTION: Any changes or modifications not expressly approved by DESKO GmbH could void the user's authority to operate the equipment.**

## 13 Appendix A / Hardware Integration Guide DESKO ICON Scanner®

The DESKO ICON Scanner® should be integrated by the provided means. This appendix refers to the respective documentation available for hardware as well as software integration.

A 3D view can be found in the according eDrawing which is part of the integration guide package:  
<ICON\_Scanner\_Integration\_Guide - eDrawing.exe>

Detailed drawings can be found in the integration guide package file:  
<ICON\_Scanner\_Integration\_Guide - Drawing.pdf>

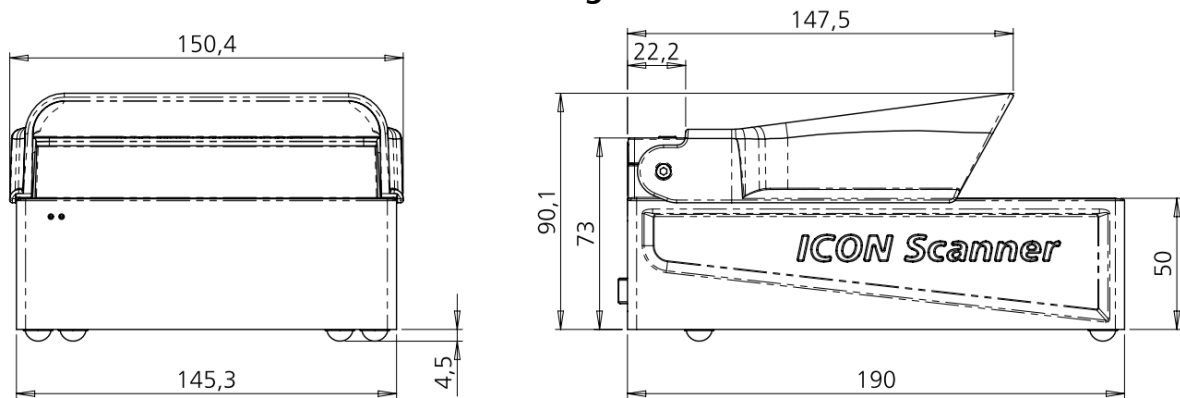
*Note: To obtain the integration guide package please contact [support@desko.com](mailto:support@desko.com)*

### 13.1 Mechanical Integration

The DESKO ICON Scanner® has 2 cover option (long cover / short cover). DESKO recommends using them also as template for the design of custom back stops.

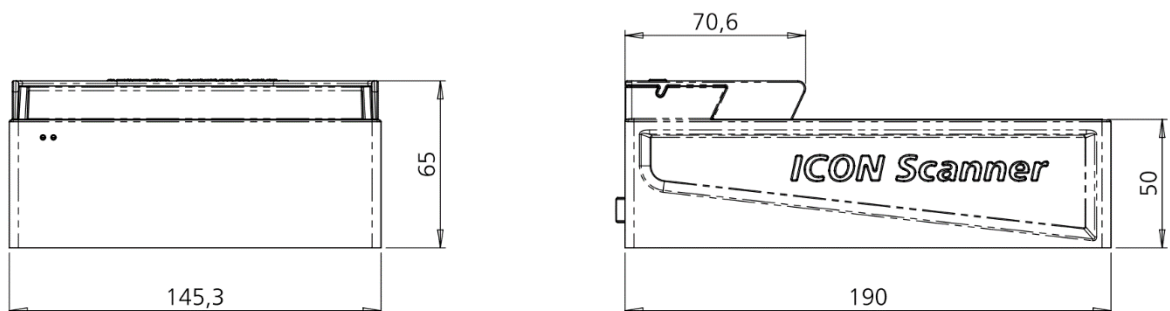
For housing, the DESKO ICON Scanner® is equipped with mounting holes on the bottom side of the device. This allows mounting the device in a customer specific environment.

#### 13.1.1 DESKO ICON Scanner® with Long Cover



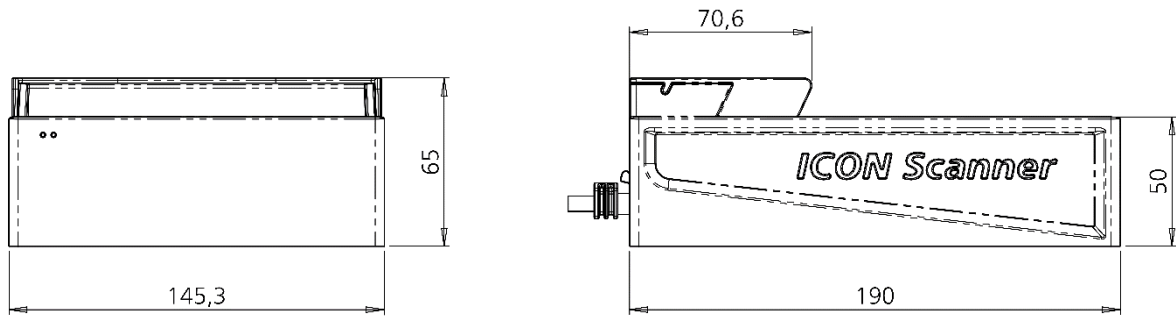
(Dimensions in mm)

#### 13.1.2 DESKO ICON Scanner® with Short Cover



(Dimensions in mm)

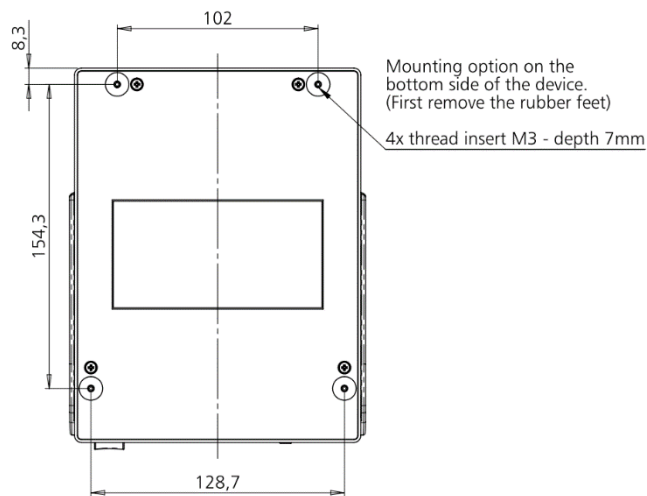
**13.1.3 DESKO ICON Scanner® OEM with Short Cover**



(Dimensions in mm)

**13.1.4 Mounting option**

The device has mounting options on the bottom side. 4 screws with M3 thread are required. For dimensions of the mounting positions see the drawing below.



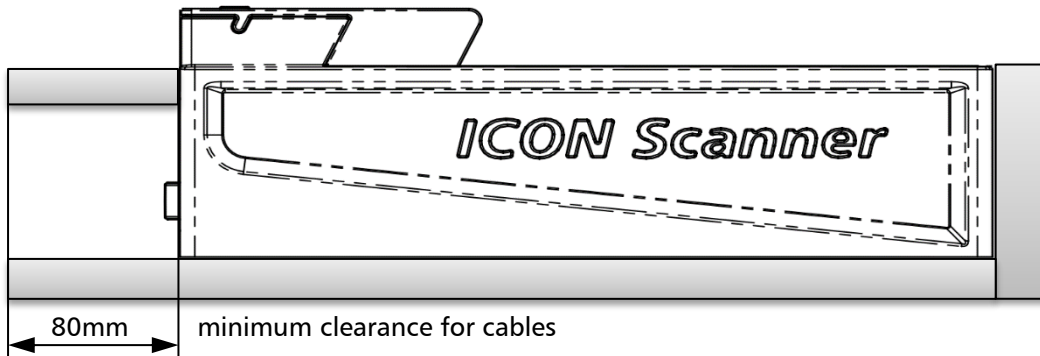
(Dimensions in mm)

## 13.2 Special Integration Rules

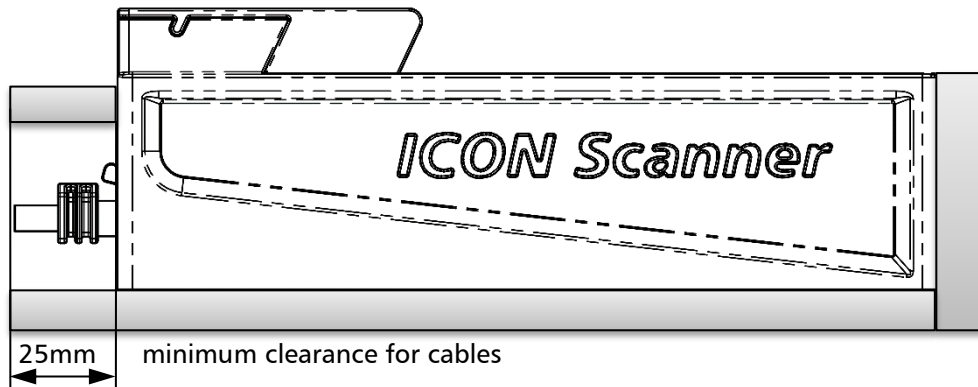
To avoid problems in the integration and to achieve the best performance we recommend the following notes.

### 13.2.1 Space for Cables

Make sure there is enough space for connecting the cables.



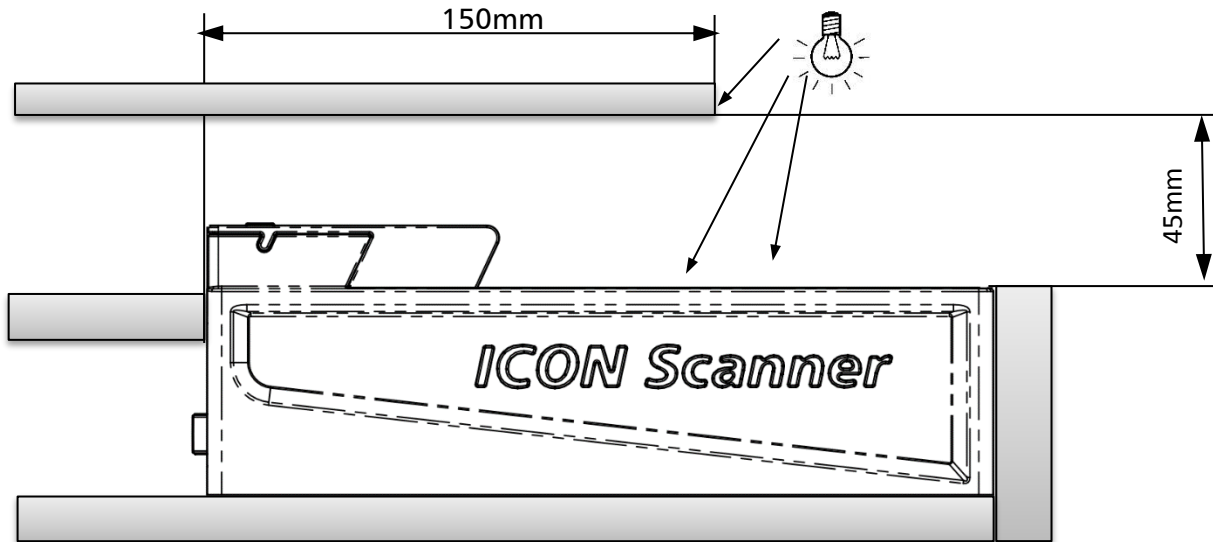
DESKO ICON Scanner®



DESKO ICON Scanner® OEM

### 13.2.2 Extraneous Light

For integration of the DESKO ICON Scanner® and DESKO ICON Scanner® OEM with short cover a shading for extraneous light from top and from side is recommended to achieve best image quality.



### 13.2.3 RFID Integration

When integrating a DESKO ICON Scanner® or a DESKO ICON Scanner® OEM with RFID option, please make sure there is no metal close to the device. Any metal near to the DESKO ICON Scanner® with RFID option detunes the RFID antennas and the RFID reading has no longer the specified performance.



Metal environment (red marked)

If you want to integrate a DESKO ICON Scanner® with RFID option in a metal environment, please contact your DESKO contact person to discuss special integration rules.