

Technical Specification

DESKO ICON Scanner

ICON Scanner Long Cover



ICON Scanner Short Cover



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DESKO Official Explanation of Abbreviations

· API	Application Programming Interface
· BGR	Boarding Gate Reader
· BC	Barcode
· BCR	Barcode Reader
· 1D code	Linear or one-dimensional Barcode
· 2D code	Two-dimensional Barcode
· DPI	Dots per Inch
· ICAO	International Civil Aviation Organization
· IP	Ingress Protection
· IR	Infrared
· ISO	International Organization for Standardization
· LED	Light Emitting Diode
· LPS	Low Power Supply
· MRZ	Machine Readable Zone
· MSR	Magnetic Stripe Reader
· NFC	Near Field Communication
· OCR	Optical Character Recognition
· PCB	Printed Circuit Board
· QIG	Quick Installation Guide
· RFID	Radio Frequency Identification
· RS232	Serial Interface
· SDK	Software Development Kit
· USB	Universal Serial Bus
· UV	Ultraviolet Light
· VIS	Visible Light

1 Security Advice, Handling Rules & Package Content

1.1 Security Advice

The ICON Scanner 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 ICON Scanner

The ICON Scanner is designed to work in a rough environment and to withstand light shocks.

Nevertheless, DESKO recommends the following handling rules:

- 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 by pulling on its cover.
- To avoid scratches prevent the glass surface from sharp objects.

1.3 Package Content

1.3.2 Standard Version

- ICON Scanner
- Power supply (5.0V DC), different country versions
- USB 2.0 cable
- Quick Installation Guide with the link and log-in data for the ICON Scanner download area. Within the download area you will find all relevant documents for the ICON Scanner and necessary tools and drivers.

1.3.2 OEM Version

- ICON Scanner
- Quick Installation Guide with the Web link and log-in data for the DESKO ICON Scanner download area.

2 Introduction

This guide describes the standard use of the ICON Scanner with all features and hardware configurations. The delivered features and hardware configurations depend on the ordered configuration. Detailed information on the respective configuration can be found in the Quick Installation Guide, which is shipped with the device.

The ICON Scanner is a full-page scanner designed to be used in self-service and agent operated environments.

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.

Should you need further information on the specific features or the configuration of your ICON Scanner, please contact our sales team at sales@desko.com. Please always state the serial number of the device in your email.

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

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



Pic.2.1: Front view of ICON Scanner with long cover



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



Pic.2.3: Front view of ICON Scanner with short cover

3. Features of the ICON Scanner

3.1 Technical Features of the ICON Scanner

- 5 megapixels high quality image sensor (resolution up to 600 dpi)
- Visible, IR and UV-A light source
- Dual RFID antenna with full NFC support

3.2 Key Features of the ICON Scanner

The 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 Optical Character Recognition (OCR) Reader

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 and 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 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), and ICAO 9303.

RFID ePassport reading for BAC takes an average around 1.5 seconds, depending on the PC system and application.

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

3.2.3 Passport Image Scanning

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

The image resolution of the ICON Scanner is scalable up to 600 DPI. Scanned images are glare reduced. Optional elimination of extraneous light is available.

Scanning time for all three images takes an average time of 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 Multicolor LED

The ICON Scanner is equipped with a multicolor LED integrated in the front for visible user feedback. The LED can be controlled via the DESKO Scan API.

3.2.5 Buzzer

The ICON Scanner is equipped with an internal buzzer for audible user feedback. The buzzer volume can be controlled and adjusted via the DESKO Scan API. The ICON Scanner 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 which is shipped with the device, or contact support@desko.com.

4.2 Hardware Setup

4.2.1 ICON Scanner

Step 1 – Power Connection

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



Step 2 – Signal Connection

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



Step 3 – Turning on the ICON Scanner

After having connected the ICON Scanner, turn the device on by switching the power switch (green box).



5 Software Integration

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

Please contact support@desko.com for further information.

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 7, 8, 8.1 and 10 – both 32 bit and 64 bit
- Native C and wrappers for C++, .NET and JAVA

5.2 DESKO ePass API and PC/SC

Access on biometric passports (ePassports) can be established with the DESKO ePass 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 ePass SDK provides runtime DLLs and samples tested for the following environments:

- Windows 7, 8, 8.1 and 10 – 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.

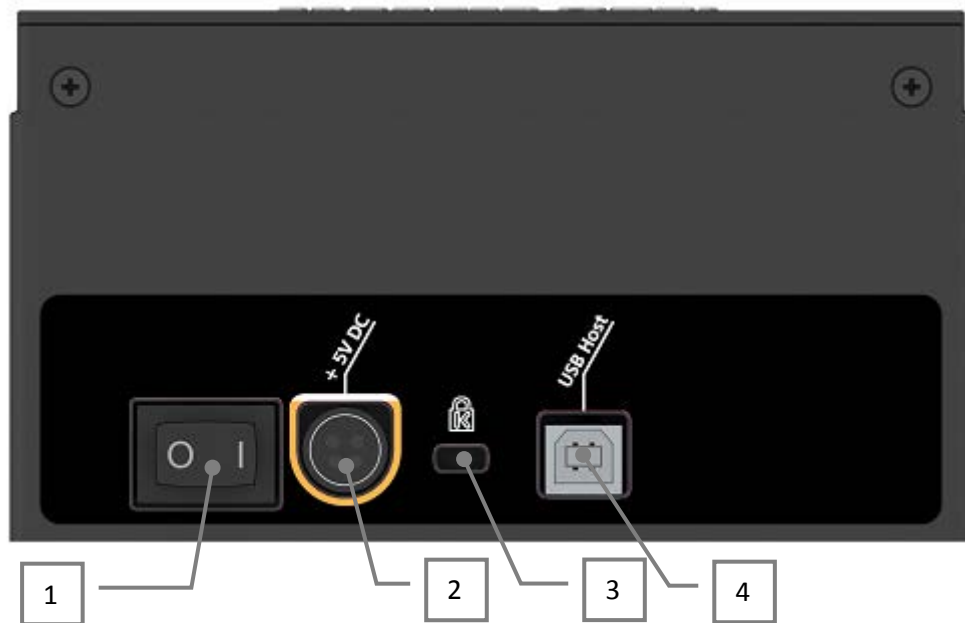
The following are common maintenance tasks:

- 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 ICON Scanner includes 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 ICON Scanner and Host PC

To use the 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 ICON Scanner is connected to a PC, the device is ready to read OCR and to scan images from different documents.

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

To scan an ID-3 passport document, place 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, place 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. ePassport):

The 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.



8 Service

If the scanning window is dirty from fingerprints, stain or dust, it can slow down the scanning performance and affect the accuracy of scanning.

8.1 Clean glass window

1. Turn off the ICON Scanner.
2. Clean the glass with a soft cloth or sponge slightly moistened with a non-abrasive glass cleaner.
3. Dry the glass with a chamois or cellulose sponge to prevent spotting.

8.2 Clean housing

1. Turn off the ICON Scanner.
2. Clean the housing with a soft cloth or sponge slightly moistened with a non-abrasive, 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, should you require any technical assistance, please contact our support team at support@desko.com.

10 Warranty

Please note that due to improper usage (see section 1.1) or after opening the device, warranty cannot be claimed anymore. Warranty excludes normal wear and tear.

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, please contact our support team:

Technical Support

E-mail : support@desko.com

Website : www.desko.com/support

Phone: +49 (0) 921 79279-69
(available during German office hours)

In order to give you an immediate and reliable support please always include the following information within your support inquiry:

- ✓ Name of the product
- ✓ Serial number of the product *(The serial number can be found on the backside of the device. It is an eleven-digit number, always starting with 20. Example: 201546 00589)*
- ✓ Used firmware, configuration and software version
- ✓ Detailed issue description
- ✓ Corresponding logfiles (VCOM with log level 4: C:\hid2ser.log and C:\Windows\hid2ser.ini (see also VCOM manual). Device updater: C:\%userprofile%\AppData\Roaming\DESKO GmbH\DeviceUpdater)
- ✓ Contact details of the person responsible at your company

12 Technical Overview

12.1 Technical Data

Supply Voltage:	5 V DC +/- 5 %
Supply Current:	2.4 A max, 2.4 A typ + 0.5A over USB
Storage Temperature:	-10 °C to +60 °C
Operating Temperature:	0 °C to +40 °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, FCC
<i>Test report available upon request.</i>	

12.2 Dimensions

Height Cover Short:	80 mm (3.15 inch)
Height Cover Long:	105.1 mm (4.14 inch) 106.0 mm (4.17 inch) with rubber feet
Width:	145,3 mm (5.72 inch)
Length:	190 mm (7.48 inch)
Scan Window Size:	95 mm (3.74 inch) x 130 (5.12 inch)
Weight:	Approx. 864 g (1.9 lb)

12.3 Features

Scanning Window:	Scanning window glass is extra toughened glass to withstand shocks and impacts. 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, ICAO 9303 and ISO/IEC 18013-3
RFID & NFC:	RFID documents according to ISO 14443 (A/B), ISO 7816 (incl. US passport), ICAO 9303 as well as NFC support (optional)
Passport Image Scanning:	Scan documents with three different light sources (VIS = 6000 K, IR = 850 nm, UV-A = 365 nm) up to 600 dpi with anti-glare support
Operating System	Windows 7, 8, 10 (32 and 64 bit)
Data Output / Connectors:	1 x USB Host 2.0,
User Feedback:	Buzzer, 1x power LED, 1x status multicolor LED

13 Appendix A / Hardware Integration Guide ICON Scanner

The 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>

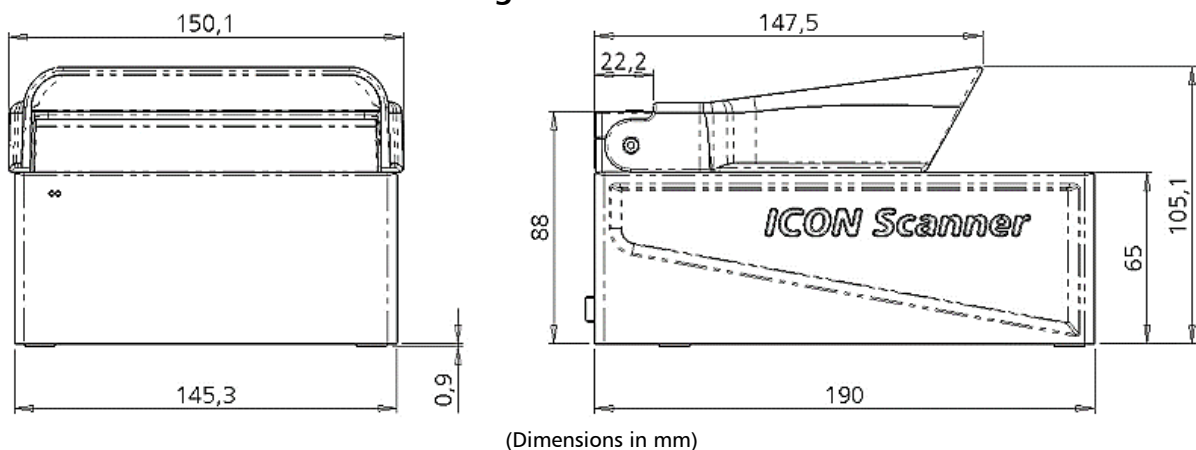
Note: To obtain the integration guide package please contact support@desko.com

13.1 Mechanical Integration

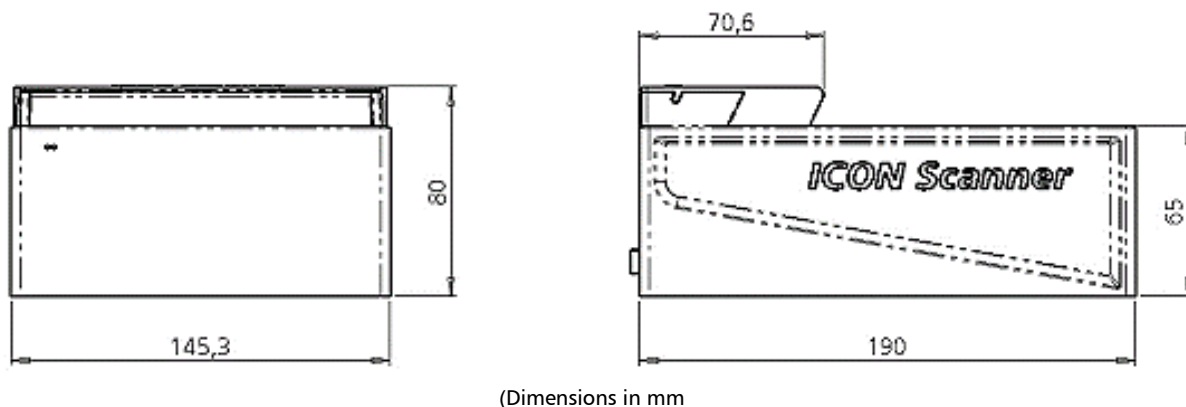
The ICON Scanner has 2 cover options (long cover / short cover). DESKO recommends using them also as template for the design of custom back stops.

For housing, the 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 ICON Scanner with Long Cover

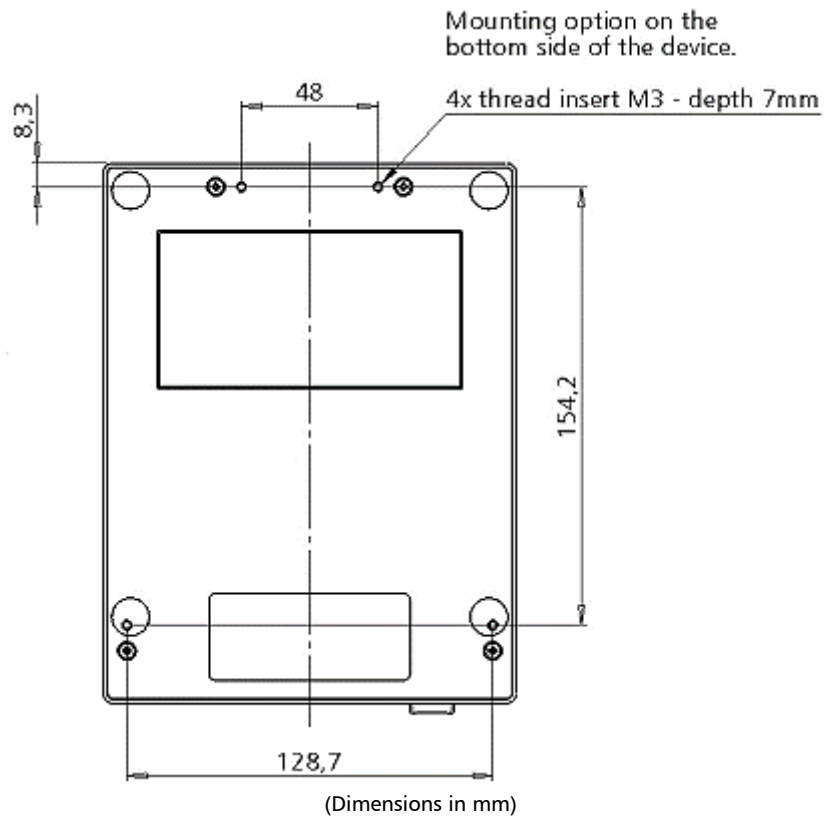


13.1.2 ICON Scanner with Short Cover



13.1.3 Mounting Options

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.

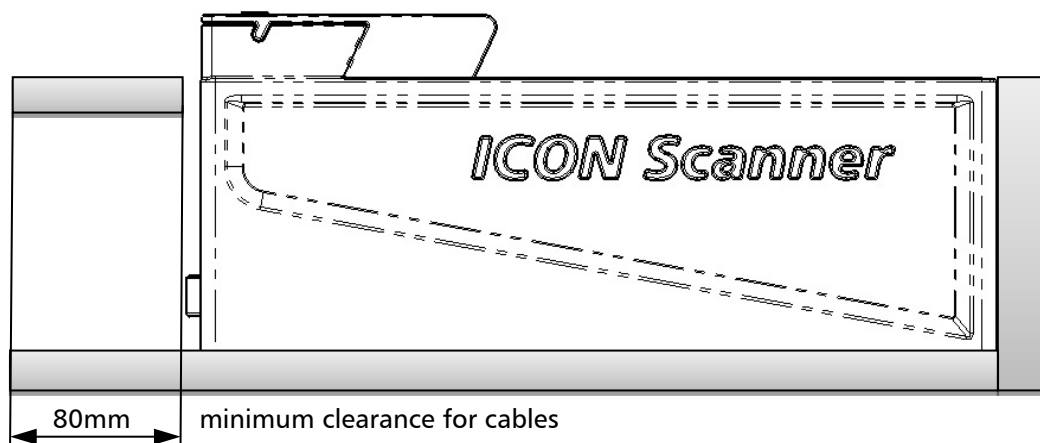


13.2 Special Integration Rules

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

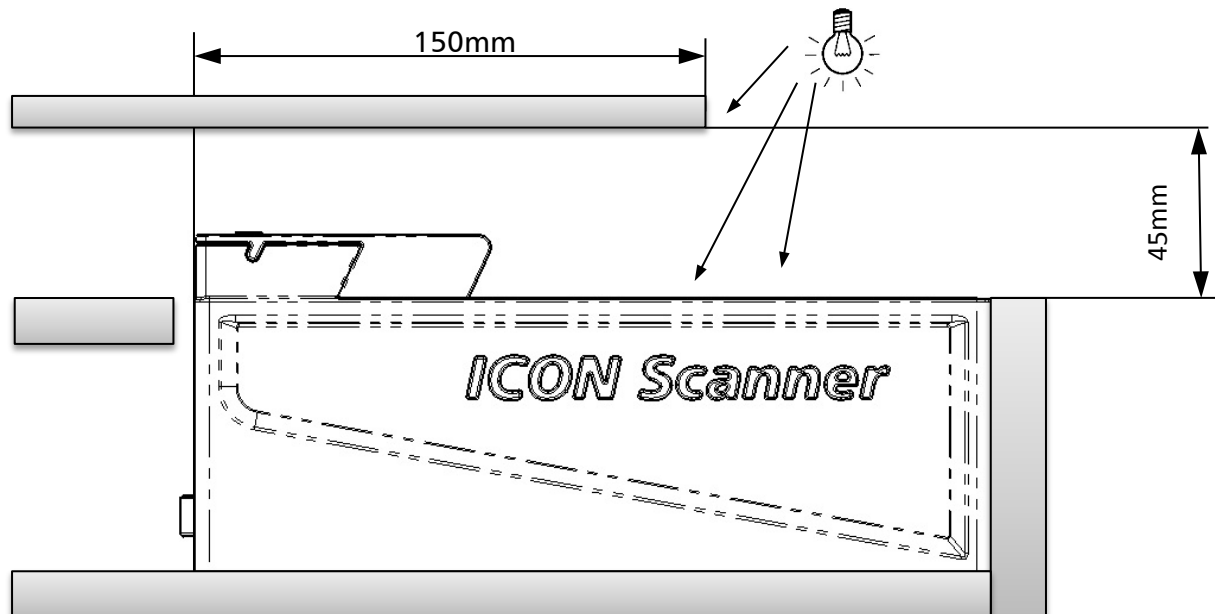
13.2.1 Space for Cables

Make sure there is enough space for connecting the cables.



13.2.2 Extraneous Light

For integration of the ICON Scanner and 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 ICON Scanner or a ICON Scanner OEM with RFID option, please make sure there is no metal close to the device. Any metal near to the 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 ICON Scanner with RFID option in a metal environment, please contact your DESKO contact person to discuss special integration rules.