The purpose of this quickstart is to allow you to commission the device quickly and easily and to achieve initial read results. This quickstart describes a stand-alone application for one device based on the default settings. The optional CDB650-204 connection module is used for the industrial-standard signal distribution of the device.

This quickstart is applicable for the variants according to the system code. ➔ See “Type code” on page 6.

Supplementary and other relevant documents
More information, such as application examples and downloads of associated documents (operating instructions) and associated software, can be found on the SICK product page on the Internet: www.sick.com/Lector63x

Information about configuration can be found in the online help function of the SOPAS ET configuration software.

Safety information

• This chapter is about the safety of commissioning personnel, as well as operators of the system in which the device is integrated.
• Read this quickstart carefully before commissioning the device in order to familiarize yourself with the device and its functions. The quickstart must be kept in the immediate vicinity of the device where they can be accessed at all times.
• For integrable illumination, only units provided by SICK for that purpose may be used.
• During operation, the temperature of the device (particularly on the rear where the cooling fins are located) can reach 70 °C.
• The camera housing of the device does not have a specific enclosure rating. When mounted, the Lector63x Flex can achieve an enclosure rating of IP 67 if the following specifications are met:
   - The optics protective hood is tightly screwed onto the camera housing.
   - The cap for the microSD card slot at the top of the device must be screwed tightly onto the device.
   - The SICK cables plugged into the M12 and M8 connections must be screwed tight.
   - Electrical connections that are not being used must be fitted with protective caps or plugs.
   - Only operate the device without the cover for the memory card slot for a short period while inserting or removing the memory card. During this time, protect the device against moisture and dust.
   - Opening the screws of the device housing will invalidate any warranty claims against SICK AG. For further warranty provisions, see the General Terms and Conditions of SICK AG, e.g., on the delivery note of the device.
   - Data integrity: SICK AG uses standardized data interfaces, e.g., standard IP technology, in its products. The emphasis here is on the availability of products and their features. SICK AG always assumes that the integrity and confidentiality of the data and rights affected by the use of these products will be ensured by the customer. In all cases, appropriate security measures, such as network separation, firewalls, virus protection, and patch management, must be taken by the customer on the basis of the situation in question.

Optical radiation
The Lector63x Flex corresponds to laser class 1. The V155i integrable illumination unit conforms to LED risk group RG 1 or RG 2 depending on the variant. ➔ See “Technical data (excerpt)” on page 5.

CAUTION
Do not look into the light source intentionally.
• Do not open the housing. Opening the housing may increase the level of risk.
• Comply with the current national regulations on photobiological security of lamps and lamp systems.

Risk group 2:
Color of illumination: blue (angle of radiation: narrow)

CAUTION

Warning! Optical radiation: LED risk group 2, visible radiation, 400 nm to 780 nm
Potentially dangerous optical radiation. Can be damaging to the eyes.
• Do not look into the light source for extended periods of time.
• Never point the light source at people.
• Avoid light source reflections caused by reflective surfaces. Be particularly careful during mounting and alignment work.
• Do not open the housing. Opening the housing may increase the level of risk.
• Comply with the current national regulations on photobiological security of lamps and lamp systems.

For laser and LED radiation
It is not possible to entirely rule out temporary disorienting optical effects, particularly in conditions of dim lighting. Disorienting optical effects may come in the form of dazzle, flash blindness, afterimages, photosensitive epilepsy, or impairment of color vision for example.

• CAUTION — if any operating or adjusting devices other than those specified here are used or other methods are employed, this can lead to dangerous exposure to radiation.
• If the device is operated in conjunction with external illumination systems, the risks described here may be exceeded. This must be taken into consideration by users on a case-by-case basis. It may be advisable to consult the manufacturer.
More information "Technical data (excerpt)" on page 5.

Important!

Illumination unit with LEDs in risk group RG 2

This illumination unit variant comes with a warning label for optical radiation. This label must be attached during mounting. See "Attaching the warning label for risk group RG 2" on page 2.

Commissioning and configuration

Scope of delivery

- The version of the Lector63x Flex (camera housing) ordered, including two M5 sliding nuts.

The electrical connections are fitted with protective caps and plugs, and in the modular variant, the light inlet is also fitted with a protective cap.

- Additional in the finished variant: lens, spacers, illumination unit connector, optics protective hood, spacer ring, and filter (if applicable)

- 2 round labels

- Allen wrench, size 2

- Printed quickstart in German and English. Other language versions may be available in PDF format from the online product page: www.sick.com/Lector63x

- Optional accessories if ordered additionally

Step 1: Assembly of modular variants

Only modular variants require assembly. The finished variants are delivered fully assembled.

NOTE

Potential damage due to electrostatic discharge!

Electrostatic discharge from the human body may damage parts of the illumination unit or the camera housing.

- Take the necessary ESD precautions for the assembly of the device.

- With the "Wide" illumination unit variants: Do not insert your fingers into the recesses.

- Do not touch the open contacts of the electrical connection for the illumination unit on the camera housing.

NOTE

Possible impairment of image quality!

Dust and fingerprints on optical boundary surfaces can reduce image quality and may also affect the decoding performance of the device.

- Do not touch the open contacts of the electrical connections.

- Do not touch the image sensor (CMOS) in the light inlet opening of the device or the glass lenses at either end of the lens unit.

- When mounting components, always ensure that the environment is free of dust and dry.

- Do not touch the image sensor (CMOS) in the light inlet opening of the device or the glass lenses at either end of the lens unit.

- Ensure a clear view of the codes to be detected on the light emission.

- Ensure shock- and vibration-free mounting of the device.

- Ensure there is enough space between the rear of the device and the wall to allow the heat to be properly dissipated into the air by means of convection.

Equipment required

- Two or four M5 screws for mounting the device on a bracket or on the customer. The screw length depends on the mounting base and the wall thickness of the bracket. When using optional SICK brackets, screws for the device are included with delivery.

Mounting requirements

- Observe the permissible ambient conditions, such as ambient temperature, ground potential, etc. for the operation of the device. See "Technical data (excerpt)" on page 5. See warning "Risk of injury and damage caused by electrical current" on page 3.

- Dissipation of lost heat from device:
  - It is important to ensure good heat transfer from the device to the mounting base (e.g., profile) via the bracket, particularly in the case of high ambient temperatures.
  - If the device is highly enclosed, make sure there is enough space between the rear of the device and the wall to allow the heat to be properly dissipated into the air by means of convection.

- Use a stable bracket with sufficient load-bearing capacity and suitable dimensions for the device. Net weight of camera housing 430 g without lens, illumination unit, cables, etc. See "Device structure (camera housing)" on page 4.

- Ensure shock- and vibration-free mounting of the device.

- Ensure a clear view of the codes to be detected on the objects.

Mounting the device

1. Mount the device. Perform one of the following steps:

   - Mount the optional SICK bracket (e.g., mounting bracket part no. 2078970) to the

   - Mount the illumination unit connector onto the camera housing if necessary.

   - Mount the illumination unit using the 4 screws.

   - If the device is highly enclosed, make sure there is enough space between the rear of the device and the wall to allow the lost heat to be properly dissipated into the air by means of convection.

   - Use a stable bracket with sufficient load-bearing capacity and suitable dimensions for the device. Net weight of camera housing 430 g without lens, illumination unit, cables, etc. See "Device structure (camera housing)" on page 4.

   - Ensure shock- and vibration-free mounting of the device.

   - Ensure a clear view of the codes to be detected on the objects.

Working distance in mm | Spacer ring in mm | Focal distance of lens
---|---|---
9.6 mm | 17.5 mm | 25 mm
50 ... 65 | 2.3 | 3
60 ... 95 | 1.5 + 2.3 | 3
70 ... 90 | 2.3 | 1.5 + 1.5 + 1.5 + 3
80 ... 100 | 2.3 | 1.5 + 2.3 + 3
90 ... 120 | 1.5 | 2.3 + 3
100 ... 130 | 1.5 | 1.5 + 3
110 ... 170 | 1.5 | 1.5 + 2.3

1. No spacer ring required
2. For these working distances you need longer spacers and a longer illumination unit connector (part number 2079501), plus a higher lens protective hood (part number 2079127)
3. Working distance with this lens not possible

Tab. 1: Required spacer ring for working distances

4. Mount the spacer ring, lens, illumination unit connector, and spacer only when there is no power to the system.

5. Mount the spacer if necessary. Max. recommended torque: 65 Ncm.

6. Insert the illumination unit connector onto the camera housing if necessary.

7. Mount the illumination unit using the 4 screws.

8. Use Allen wrench, size 2, for this purpose.

9. Mount the optics protective hood.

Attaching the warning label for risk group RG 2

A warning label is included with delivery in the case of illumination variants with LEDs in risk group RG 2. See Technical Information V1551 illumination unit device (part number 8018486).

- Attach the warning label to the optics protective hood near the light emission.

- Dissipation of lost heat from device:
  - It is important to ensure good heat transfer from the device to the mounting base (e.g., profile) via the bracket, particularly in the case of high ambient temperatures.
  - If the device is highly enclosed, make sure there is enough space between the rear of the device and the wall to allow the lost heat to be properly dissipated into the air by means of convection.

- Use a stable bracket with sufficient load-bearing capacity and suitable dimensions for the device. Net weight of camera housing 430 g without lens, illumination unit, cables, etc. See "Device structure (camera housing)" on page 4.

- Ensure shock- and vibration-free mounting of the device.

- Ensure a clear view of the codes to be detected on the objects.

Mounting the device

1. Mount the device. Perform one of the following steps:

   - Mount the optional SICK bracket (e.g., mounting bracket part no. 2078970) to the

   - Mount the illumination unit connector onto the camera housing if necessary.

   - Mount the optics protective hood.

   - Dissipation of lost heat from device:
     - It is important to ensure good heat transfer from the device to the mounting base (e.g., profile) via the bracket, particularly in the case of high ambient temperatures.
     - If the device is highly enclosed, make sure there is enough space between the rear of the device and the wall to allow the lost heat to be properly dissipated into the air by means of convection.

   - Use a stable bracket with sufficient load-bearing capacity and suitable dimensions for the device. Net weight of camera housing 430 g without lens, illumination unit, cables, etc. See "Device structure (camera housing)" on page 4.

   - Ensure shock- and vibration-free mounting of the device.

   - Ensure a clear view of the codes to be detected on the objects.

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   - Use a stable bracket with sufficient load-bearing capacity and suitable dimensions for the device. Net weight of camera housing 430 g without lens, illumination unit, cables, etc. See "Device structure (camera housing)" on page 4.

   - Ensure shock- and vibration-free mounting of the device.

   - Ensure a clear view of the codes to be detected on the objects.

Mounting the device

1. Mount the device. Perform one of the following steps:

   - Mount the optional SICK bracket (e.g., mounting bracket part no. 2078970) to the

   - Mount the illumination unit connector onto the camera housing if necessary.

   - Mount the optics protective hood.
device using the two sliding nuts.
- Mount the device on a bracket using M5 screws. To do this, either use the 4 threaded mounting holes on the rear of the device or, alternatively, use the two M5 sliding nuts in the lateral slots.

Insert the screws into the threaded mounting holes or sliding nuts by a maximum of 5 mm. ➔ Dimensional drawing, see “Device structure (camera housing)” on page 4.

Aligning the reading window of the device with the code
Remember to consider the shape and alignment of the field of view in front of the device.

Taking account of the working distance, depending on the resolution
Resulting reading ranges: ➔ See Fig. 11 on page 7 and Fig. 12 on page 7.

Taking account of the reading angle

Mount the CDB650-204 so that access to the device is possible at any time. To do this, see the CDB650-204 connection module operating instructions (part number 8016155).

Step 3: Electrical installation

- The electrical installation must only be performed by electrically qualified persons.
- Standard safety requirements must be met when working in electrical systems.
- Electrical connections between the device or other devices may only be made or separated when there is no power to the system. Otherwise, the devices may be damaged.
- When using connecting or extension cables with an open end, make sure that bare wire ends are not touching. There is a risk of short-circuit when the supply voltage is switched on. Wires must be appropriately insulated from each other.
- Wire cross-sections in the supply cable from the customer's power system must be designed in accordance with the applicable standards.
- If the supply voltage for the device is not supplied via the CDB650-204 connection module, the device must be protected by a separate max. 2.0 A slow-blow fuse in the supply circuit.
- All circuits connected to the device must be designed as SELV circuits (SELV = Safety Extra Low Voltage).

![Image sensor 1.3 Mpix](image1)
![Image sensor 1.9 Mpix](image2)

Field of view

Fig. 3: Image sensor-dependent viewing ranges in front of the device; size stretching is distance-dependent

![Image display](image3)

Typical 10° ... 20°

Fig. 4: Selection of the skew angle, depending on the application

- Tilt the device away from the plane that is perpendicular to the surface of the code to avoid as many interfering reflections as possible. Typically, this angle will be between 10° and 20°.

In the case of codes created on metal, e.g., by dot peening, an angle of between 0° (bright field light) and 45° (dark field light) may be advisable.

Mounting the optional connection module

Mount the CDB650-204 connection module in the vicinity of the device. The recommended cable length between the devices is max. 5 m.

![Image sensor](image4)

![Field of view](image5)

![Connection module Lector63x](image6)

Fig. 5: Block wiring diagram for commissioning a Lector63x Flex (V2363x0-Mxxx0x)

Step 4: Configuration

The SOPAS ET configuration software is used by default for configuring the device. Use at least version V2.38 for this. We recommend using the latest version.

Installing and starting the configuration software

1. Download and install the latest version of the SOPAS ET configuration software, as well as current device description files (*.sdd), from the online product page for the software by following the instructions provided there.

2. Select the “Complete” option here. Administrator rights may be required on the PC to install the software.

3. Select the required user interface upon startup:
   - “Standard” user interface for standalone applications
   - “Advanced” user interface if the device is integrated in a network (e.g., CAN bus)

4. Establish a connection between the software and the device via Ethernet or USB.

5. Select Lector63x Flex from the list of available devices. SOPAS ET establishes communication with the device and loads the associated device description file for the device. The program window, which is divided into three sections, opens.

6. In the Wizard window, click the Start button. The device will now continuously record images, decode them and attempt to automatically find the appropriate settings for the image and the decoder. If the read is successful, these settings can be saved immediately. In the case of time-critical applications, fine adjustment can be used to automatically identify time-optimized settings to reduce the analysis time per image. Alternatively, it is possible to record images in Edit mode and manually adjust the settings on the right-hand side of the screen. The effects of any parameter changes are directly visible.

Configuring the device

1. In the Online Image window, click the Exit button. In Edit mode, the device starts recording images consecutively and uses the current settings to decode them. The effects of any parameter changes are directly visible.

The following functions are deactivated in Edit mode:
- Switching inputs and outputs
- Data output via the host interface

2. Align the device in the desired depth of field range with a medium-height object with a test code.

3. Click the Camera & Illumination configuration bar. Use the Shutter Timer and Brightness sliders to adjust the image brightness so that the code is easy to see.

Table of connections:

<table>
<thead>
<tr>
<th>Connection module CDB650-204</th>
<th>Lector®63x</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Ethernet cable (male connector, M12, 17 pin, A-coax)</td>
</tr>
<tr>
<td>Supply voltage VCC</td>
<td>Ethernet cable (male connector, M12, 8-pin, X-coded / male connector, RA5, 8-pin)</td>
</tr>
<tr>
<td>USB</td>
<td>alternative e.g., USB cable (male connector, M8)</td>
</tr>
</tbody>
</table>

![Diagram](image7)
4. Activate the sharpness diagnosis bar. To do this, go to the Camera & Illumination area and click the Display Sharpness checkbox.

Variants with S-mount lens: Adjusting the sharpness
1. Adjust the focus using the manual focus screw on the top side of the device so that the online image display shows a sharp, clear image of the test code with no distortion. The sharpness diagnosis bar should be brought to its maximum position. The code in the image must be clearly displayed in sharp focus, and the edges must be easy to identify. Use Allen wrench, size 2, for this purpose.
2. If necessary, use the Shutter Timer, Brightness and Contrast sliders to optimize the brightness and contrast.
3. To avoid inadvertently changing the setting, cover the manual focus screw on the top side of the device.

Continuing and saving configuration
1. Go to the image display window (Online Image), click the Operation button, and test the settings in read mode (real operation).
2. Make settings for additional functions during planned operation such as codes, reading clock, read result formats, data interface, etc.
3. Save the overall configuration permanently:
   • Parameter set in the device: Click the button.
   • Configuration file on the PC: Click the button.

Device description

Device structure (camera housing)

Operating and status indicators

Status indicators in read mode

Integrable illumination unit

In the finished variant, the integrable illumination unit is already assembled. In the modular variant, you must order an VIS5I integrable illumination unit separately and assemble it yourself.

NOTE
Possible data loss or irreparable damage to the memory card!
The device does not signal the applicable type of access to the memory card (read or write).
- Do not remove the memory card or turn off the supply voltage if there are parameter values in the device that access the memory card and have been set to “continuous” with the SOPAS ET configuration software (e.g., image acquisition).
- To remove the memory card safely during operation, select the Remove Card function under Analysis toolS/MicroSD card in the SOPAS ET configuration software and wait for SOPAS ET to provide confirmation.

Inserting the memory card
The card slot is located under the cover on the top side of the device with the operating elements. ➔ See “Device structure (camera housing)” on page 4.
Compliance with enclosure rating IP 67: See “Safety information” on page 1.

1. Loosen the two Allen screws on the cover using the Allen wrench, size 2.
2. Push the cover away from the device until the card slot can be accessed.
3. Making sure it is in the correct position (with the contacts facing the device and pointing down), insert the memory card into the slot until it locks into place.
4. Screw the cover on tight.

Transport and storage

Transport and store the device in its original packaging, ensuring that the protective caps and plugs have been screwed onto the electrical connections. Do not store outdoors. To ensure that any residual moisture present can escape, do not store the device in airtight containers. Do not expose to aggressive media (e.g., solvents such as acetone).

Storage conditions: dry, dust-free, no direct sunlight, storage temperature 
-20 °C to 70 °C, as little vibration as possible, relative air humidity max. 90% (non-condensing).

Maintenance and care

The device is maintenance-free. No maintenance is required in order to ensure compliance of the aiming lasers with laser class 1 and LeD risk group rG 1 or the device is maintenance-free. No maintenance is required.

In order to obtain maximum read performance from the device, the reading window in the optics protective hood must be checked for contamination at regular intervals (e.g., weekly). This applies especially when using the device in harsh environments (dust, abrasion, moisture, etc.) The reading window must be kept clean and dry for reading.

If the reading window is dirty, gently clean the window with a soft, damp cloth (mild cleaning agent).

Important!

If the reading window is scratched or damaged, the optics protective hood must be replaced.

Static charge may cause dust particles to adhere to the reading window. This effect can be avoided by using the SICK anti-static plastic cleaner (part no. 5600006) in combination with the SICK lens cloth (part no. 4003353).

Repairs

Repair work on the device may only be performed by qualified and authorized service personnel from SICK AG.

Disassembly and disposal

CAUTION

Risk of injury due to hot device surface!

In read mode, the surface of the device (particularly at the rear) can reach temperatures of up to 70 °C.

Before commencing disassembly, switch off the device and allow it to cool down as necessary.

Any device which can no longer be used must be disposed of in an environmentally friendly manner in accordance with the applicable country-specific waste disposal regulations. The device is electronic waste and must under no circumstances be disposed of with general waste.

Sources for obtaining additional information

Additional information about the device and its optional accessories can be found on the following online product page:

Lector63x Flex image-based code reader

www.sick.com/Lector63x

For example:

- Lector63x Flex S-mount quickstart in German (part no. 8019142) and English (part no. 8019143) and possibly other languages as well
- Lector63x Flex operating instructions in German (part no. 8011070), English (part no. 8012071) and French (part no. 8020115) and possibly other languages as well.
- EU declaration of conformity
- Detailed technical specifications (online data sheet)
- Dimensional drawing and 3D CAD dimension models
- Information on accessories (including cables, brackets, trigger sensors, internal and external illumination units)
- Publications dealing with accessories

CDF600-21xx PROFIBUS DP fieldbus module

www.sick.com/CDF600-2

- Fieldbus module CDF600-21xx PROFIBUS DP operating instructions in German (part no. 8015334) and English (part no. 8015335), in other languages if required
- Technical information for the CDF600-21xx PROFIBUS DP fieldbus module in German (part no. 8015336) and English (part no. 8015337)

CDF600-22xx PROFINET fieldbus module

www.sick.com/CDF600-2

- Fieldbus module CDF600-2200 PROFINET (M12 variant) operating instructions in German (part no. 8015921) and English (part no. 8015922), in other languages if required
- Technical information for the CDF600-22xx PROFINET fieldbus module in German (part no. 8015923) and English (part no. 8015924)

Documents on request

- Overview of command strings for the Lector63x.
- Support is also available from your sales partner: www.sick.com/worldwide

Copyright notice for open-source programs

SICK uses open-source software in the Lector63x. This software is licensed by the rights holders using the following licenses among others: the free licenses GNU General Public License (GPL Version 2, GPL Version 3) and GNU Lesser General Public License (LGPL), the MIT license, zLib license, and the licenses derived from the BSD license.

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See the GNU General Public License for more information.

View the complete license texts here:

www.sick.com/licensetexts

Printed copies of the license texts are also available on request.

Technical data (excerpt)

<table>
<thead>
<tr>
<th>Type</th>
<th>Lector63x Flex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lens type, focus setting</td>
<td>S-mount lens: fixed aperture, short working distances possible using spacer ring, manual adjustment of the sharpness using focus screw</td>
</tr>
<tr>
<td>Illumination for field of view</td>
<td>Optional by means of, e.g., variants of the VI55I integrable illumination unit: 6 LEDs, visible light, switchable.</td>
</tr>
<tr>
<td>White (T = 6 000 ± 500 K)</td>
<td>Blue (A = 455 ± 20 nm)</td>
</tr>
<tr>
<td>Feedback LED (spot in field of view)</td>
<td>Optional by means of, e.g., variants of the VI55I integrable illumination unit: 1 LED, visible light.</td>
</tr>
<tr>
<td>Green (λ = 525 ± 15 nm), RG 1</td>
<td>Red (λ = 630 ± 20 nm), RG 1</td>
</tr>
<tr>
<td>LED risk group of VI55I integrable illumination unit</td>
<td>Risk group 1: “White + feedback LED” option (part no. 2078428, part no. 2078430, part no. 2078431)</td>
</tr>
<tr>
<td>Blue – wide + feedback LED (part no. 2083814)</td>
<td>Blue – medium + feedback LED (part no. 2083813)</td>
</tr>
<tr>
<td>Blue (λ = 455 ± 20 nm)</td>
<td>Blue (λ = 630 ± 20 nm)</td>
</tr>
<tr>
<td>Risk group RG 2 (moderate risk) according to IEC 62471-1: 2006-07/EN 62471-1: 2008-09 due to exposure to blue light.</td>
<td>Risk group RG 1 (low risk) corresponding to L&lt;sub&gt;r&lt;/sub&gt; &lt; 10 x 10&lt;sup&gt;4&lt;/sup&gt; W/(m²sr) within 100 s at a distance of ≥ 200 mm</td>
</tr>
<tr>
<td>Visible light, Red (λ = 630 nm ... 680 nm), can be disengaged</td>
<td></td>
</tr>
</tbody>
</table>

5
### Laser class

### Code resolution
≥ 0.05 mm, depending on lens unit

### Working distance
See Fig. 11 on page 7 and Fig. 12 on page 7.

### Lens unit
- Interchangeable, see product information for the Lector series (part no. 8016252)
- Assembled variants: lens mounted by SICK
- Modular variant: to be mounted by user

#### See “Type code” on page 6.

### Sensor resolution
See “Type code” on page 6.

### Image sensor type
See “Type code” on page 6.

### Scanning frequency at full resolution
- 1.3 Mpx: 50 Hz
- 1.9 Mpx: 50 Hz

### Bar code types (1D)
code, UPC/GTIN/EAN

### Postal codes
Postnet, Planet, USPS 45CB, Australia Post, Post Netherlands, Royal Mail, Post Sweden

### 2D code types
Data Matrix ECC200, GS1 Data Matrix, MaxiCode, PDF417, QR code

### Code qualification

### Data storage and retrieval
Image and data logging via microSD memory card (max. 32 GB), internal RAM (512 MB), and external FTP

### Serial RS-232/422
Host (300 Baud ... 115.2 kBaud), for data output

### Serial RS-232
AUX (57.6 kBaud), for configuration/diag
ostiics and image transmission

### USB
AUX (USB 2.0), for configuration/diag
nostiics and image transmission

### Ethernet
AUX, Host, image transmission (FTP), 10/100/1,000 Mbit/s, TCP/IP, Ether
net/IP, MAC address(es), see type label.

### Supply voltage
DC 12 V ... 24 V ± 20%, SELV (DIEN EN 60950-1:2014-08), LPS (DIEN EN 60950-1:2014-08) or Class 2 (UL 1310)

### Current consumption
Max. 1.5 A (with switching outputs)

### Power consumption
10 W (for unloaded switching outputs)

### Weight
Camera housing max. 430 g without lens, illumination unit, etc.

### Material housing
Aluminum die cast

## Type code

### NOTE
Not all combinations according to the type code are possible. The available device variants can be found online at: www.sick.com/Lector63x.

### Function
- R Reading (Standard 1D/2D-decoder)
- D Reading (Standard 1D/2D-decoder, DPM decoder, OCR)

### Image sensor type
- M Monochrome

### Illumination
- X No illumination unit installed
- I White wide
- K White medium
- W White narrow
- N Blue wide
- P Blue medium
- B Blue narrow

### Lens type and aperture value
- CX C-mount module, without lens
- CA 6 mm (f4 – 16)
- CB 8 mm (f4 – 16)
- CD 12 mm (f4 – 16)
- CE 16 mm (f4 – 16)
- CF 25 mm (f4 – 16)
- CG 35 mm (f4 – 16)
- CH 50 mm (f4 – 16)

### Variants with compact C-mount lens:
- MD 12 mm (f8)
- ME 16 mm (f8)
- MF 25 mm (f8)
- MG 35 mm (f8)
- MH 50 mm (f8)
- SX S-mount module, without lens
- SC 9.6 mm (f8)
- SD 12.5 mm (f8)
- SE 17.5 mm (f8)
- SF 25 mm (f8)

### Connection variant
- B Standalone USB, CAN, serial, I/O, Ethernet

### IP protection class and front screen of the optics protective hood
- 5 IP 67, plastic front screen
- 6 IP 67, glass front screen
Table 1: Designation, Supply voltage $V_S$ in [DC V], Max. supply current (2 A protection) $I_{\text{SUPP max}}$ [A], Current consumption of device Standby $I_{\text{STANDBY}}$ [A], Internal illumination off $I_{\text{INTLUM OFF}}$ [A], Internal illumination on $I_{\text{INTLUM ON}}$ [A], Typical, all 4 switching outputs loaded (0.1 A per output) $I_{\text{INTLUM ON 4 OUt}}$ [A], Power loss Internal illumination on $P_{\text{int}}$ [W] $P_{\text{int max}}$ [W], Maximum current consumption of external illumination via “External illumination” connection unit on device $I_{\text{EXT LUM}}$ [A], Min. resolution in mm 1D code 2D code.

Interpreting the diagram

You can use the diagram to determine the following data:

- The maximum working distance for a selected code resolution
- The dimensions of the available field of view

Example:

Given (in red):
- Code resolution 1: 1.0 mm
- Lens focal length 2: 12.5 mm

Read out (in green):
- Maximum working distance 3: 1,400 mm
- Field of view V2D632R 4: approx. 800 mm x 600 mm

Field of view for Lector631 (1.3 Mpx) S-mount

Field of view in mm²

<table>
<thead>
<tr>
<th>Field of view in mm²</th>
<th>Working distance/focus position in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 x 960</td>
<td>0 200 400 600 800 1000 1200 1400 1600 2000 2200</td>
</tr>
<tr>
<td>1000 x 800</td>
<td>a 1.3 b 1.2 c 1.1 d 1.0</td>
</tr>
<tr>
<td>800 x 640</td>
<td>a 1.3 b 1.2 c 1.1 d 1.0</td>
</tr>
<tr>
<td>600 x 480</td>
<td>a 1.3 b 1.2 c 1.1 d 1.0</td>
</tr>
<tr>
<td>400 x 320</td>
<td>a 1.3 b 1.2 c 1.1 d 1.0</td>
</tr>
<tr>
<td>200 x 160</td>
<td>a 1.3 b 1.2 c 1.1 d 1.0</td>
</tr>
</tbody>
</table>

Field of view diagram for Lector631 Flex S-mount, field of view: width x height, typical values

Field of view diagram for Lector632 (1.9 Mpx) S-mount

Field of view in mm²

<table>
<thead>
<tr>
<th>Field of view in mm²</th>
<th>Working distance/focus position in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 x 900</td>
<td>0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200</td>
</tr>
<tr>
<td>1000 x 750</td>
<td>a 1.0 b 0.9 c 0.8 d 0.7</td>
</tr>
<tr>
<td>800 x 600</td>
<td>a 1.0 b 0.9 c 0.8 d 0.7</td>
</tr>
<tr>
<td>600 x 450</td>
<td>a 1.0 b 0.9 c 0.8 d 0.7</td>
</tr>
<tr>
<td>400 x 300</td>
<td>a 1.0 b 0.9 c 0.8 d 0.7</td>
</tr>
<tr>
<td>200 x 150</td>
<td>a 1.0 b 0.9 c 0.8 d 0.7</td>
</tr>
</tbody>
</table>

Field of view diagram for Lector632 Flex S-mount, field of view: width x height, typical values
### Overview of design of connections and pin assignment

<table>
<thead>
<tr>
<th>Power, I/O, SerialData, CAN</th>
<th>USB</th>
<th>External illumination connection</th>
<th>GB Ethernet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male connector, M12, 17-pin, A-coded</td>
<td>Female connector, M8, 4-pin</td>
<td>Female connector, M12, 4-pin, A-coded</td>
<td>Female connector, M12, 8-pin, X-coded</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Signal</th>
<th>Signal</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>+5 V</td>
<td>V_s switchable output</td>
<td>TRD0_P</td>
</tr>
<tr>
<td>2</td>
<td>Supply voltage V_s</td>
<td>Data–</td>
<td>Trigger illumination DC V_s</td>
<td>TRD0_N</td>
</tr>
<tr>
<td>3</td>
<td>CAN L</td>
<td>Data+</td>
<td>GND</td>
<td>TRD1_P</td>
</tr>
<tr>
<td>4</td>
<td>CAN H</td>
<td>GND</td>
<td>–</td>
<td>TRD1_N</td>
</tr>
<tr>
<td>5</td>
<td>TD+ (RS-422), Host</td>
<td>–</td>
<td>–</td>
<td>TRD3_P</td>
</tr>
<tr>
<td>6</td>
<td>TD– (RS-422), Host</td>
<td>TxD (RS-232), Host</td>
<td>–</td>
<td>TRD3_N</td>
</tr>
<tr>
<td>7</td>
<td>TxD (RS-232), Aux</td>
<td>–</td>
<td>–</td>
<td>TRD2_P</td>
</tr>
<tr>
<td>8</td>
<td>RxD (RS-232), Aux</td>
<td>–</td>
<td>–</td>
<td>TRD2_N</td>
</tr>
<tr>
<td>9</td>
<td>SensGND</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>10</td>
<td>Sensor 1, switching input</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>11</td>
<td>RD+ (RS-422), Host</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>12</td>
<td>RD– (RS-422), Host</td>
<td>RxD (RS-232), Host</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>13</td>
<td>Result 1, switching output</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>14</td>
<td>Result 2, switching output</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>15</td>
<td>Sensor 2, switching input</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>16</td>
<td>Result 3, switching output</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>17</td>
<td>Result 4, switching output</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

1) Pin assignment for ICL illumination. Pin assignment for VLR illumination: Pin 1: V_s triggered, Pin 2: Not assigned, Pin 3: GND, Pin 4: Not assigned. The pins are assigned internally in the device by selecting the ICL or VLR illumination with SOPAS ET configuration software.

### Overview of application examples

![Application examples for the Lector63x Flex](image)

### Assembly of variants with S-mount lenses

![Assembly of Lector63x Flex with S-mount lens](image)

*Fig. 14: Assembly of Lector63x Flex with S-mount lens*

1. Camera housing
2. Spacer (4 x) for integrable illumination unit
3. Spacer ring (optional)
4. Illumination unit connector
5. S-mount lens
6. Integrable illumination unit
7. Optical filter (optional)
8. Filter holder
9. Optics protective hood