Lector63x Flex C-mount
Image-based code reader with manually adjustable focus

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 type 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](http://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 it can be accessed at all times.
- For integrable illumination, only units provided by SICK for that purpose may be used.
  - During operation, the surface 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 cover 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 or M8 connections must be screwed tight.
    - Electrical connections that are not being used must be fitted with protective caps or plugs.

which must be screwed tight (as they are on delivery).
- Only operate the device without the cover for the microSD 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 VI55I 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**

- Optical radiation: LED risk group 1, visible radiation, 400 nm to 780 nm
- The LEDs may pose a danger to the eyes in the event of incorrect use.
  - Do not look into the light source intentionally.
  - Do not open the housing. Opening the housing will not switch off the light source. Opening the housing may increase the level of risk.

**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.
  - Avoid light source reflections caused by reflective surfaces. Be particularly careful during mounting and alignment work.
  - Do not open the housing. Opening the housing will not switch off the light source. Opening the housing may increase the level of risk.

**Risk group 3:**
- Color of illumination: blue (angle of radiation: wide)

**CAUTION**

- Do not open the housing. Opening the housing will not switch off the laser. Opening the housing may increase the level of risk.
- Current national regulations regarding laser protection must be observed.

**LED radiation**

**Risk group 1:**
- Color of illumination: blue (angle of radiation: wide, medium) or white. Color of spot: red, green

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 can in some cases 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.

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 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, illumination unit, optics protective hood, spacer ring, and filter (if applicable).
- 2 round labels
- Allen wrench, size 2
- Printed quickstarts 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.

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.

Compliance with enclosure rating IP 67: → See “Safety information” on page 1.

Equipment required
- Allen wrench, size 2 (included in scope of delivery)
- Socket wrench, size 5, ideally as torque wrench
- Allen wrench, size 2 (included in scope of delivery)
- Printed quickstarts 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

Assembling modular variants with compact C-mount lenses
→ See Fig. 13 on page 8.

Mount the filter, seal, lens, illumination unit connector, and spacer only when there is no power to the system.
1. Place the camera housing on a nonslip base.
2. Remove the protective cap from the round light inlet.
3. Carefully insert the optional filter and spacer disk into the light inlet.
4. Screw the lens unit into the C-mount thread until the stop point is reached. This will also lock the optional filter in place at the same time.
5. Mount the 4 spacer Max. recommended torque: 65 Ncm.
6. Insert the illumination unit connector.
7. Mount the illumination unit using the 4 screws. Use Allen wrench, size 2, for this purpose.
8. If the required adjustments are not carried out immediately, mount the optics protective hood.

Assembling modular variants with C-mount lenses and external ICL ring lighting
→ See Fig. 14 on page 8.

Mount the filter, seal, lens, and mounting bracket only when there is no power to the system.
1. Place the camera housing on a nonslip base.
2. Remove the protective cap from the round light inlet.
3. Carefully insert the optional filter and spacer disk into the light inlet.
4. Screw the lens unit into the C-mount thread until the stop point is reached. This will also lock the optional filter in place at the same time.
5. Mount both mounting brackets to the side of the camera housing.

6. If the required adjustments are not carried out immediately, mount the optics protective hood.
7. Mount the ICL illumination unit. Connect the cable (female connector, M8, 4-pin / male connector, M12, 4-pin, A-coded) to the device and the illumination unit.

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 on IVISI illumination unit device (part no. 8018486).

Mount the warning label to the optics protective hood near the light emission.

Step 2: Mounting and alignment

NOTE
Radio interference may occur when the device is used in residential areas!
Only use the device in industrial environments (EN 61000-6-4).

Equipment required
- Two or four M5 screws for mounting the device on a bracket supplied by 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
- Operate 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 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. → dimensional drawing, see “Device structure (camera housing)” on page 4.
- Ensure shock- and vibration-free mounting of 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 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.

   Fig. 2: Image sensor-dependent viewing ranges in front of the device; size stretching is distance-dependent

Taking account of the working distance, depending on the resolution
Resulting reading ranges: → See Fig. 10 on page 7 and Fig. 11 on page 7

8019141/EMO3/2017-05-12 • Subject to change without notice • SICK AG • Waldkirch • Germany • www.sick.com
Taking account of the reading angle

![Diagram showing skew angle for peening]

- All circuits connected to the device must be designed as SELV circuits (SELV = Safety Extra Low Voltage).

**WARNING**

Risk of injury and damage caused by electrical current!

The device is designed to be operated in a system with professional grounding of all connected devices and mounting surfaces to the same ground potential. Incorrect grounding of the Lector63x Flex can result in equipotential bonding currents between the device and other grounded devices in the system. This can lead to hazardous voltages being applied to the metal housing, cause devices to malfunction or sustain irreparable damage, and damage the cable shield as a result of a heat increase, causing cables to set alight.

- Ensure that the ground potential is the same at all grounding points.
- If the cable insulation is damaged, disconnect the supply voltage immediately and have the damage repaired.

### 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 when using the serial data interface (RS-232). 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 no. B016155).

### 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 of 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.

### 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.

www.sick.com/SOPAS_ET

Select the “Complete” option here.

Administrator rights may be required on the PC to install the software.

2. 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).

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

   The connection wizard starts automatically.

4. The following IP address is configured by default on the device:
   - IP address: 192.168.0.1
   - Subnet mask: 255.255.255.0

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.

### 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.

4. If necessary, use the Shutter Timer, Brightness and Contrast sliders to optimize the brightness and contrast.

#### Variants with compact C-mount lens:

**Adjusting the brightness and sharpness**

1. Remove the optics protective hood.
2. Loosen the lock nut fitting on the lens.
3. Adjust the focus using the knurled adjustment ring 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.
4. If necessary, use the Shutter Timer, Brightness and Contrast sliders to optimize the brightness and contrast.

![Diagram showing connection module CDB650-204 and Lector63x Flex]

![Diagram showing block diagram for commissioning a Lector63x Flex (V2D63xR-MxxxxBx)]

![Diagram showing SOPAS ET program window example with options for wizard mode, image display, and configuration areas]
5. Use the lock nut fitting to fix the sharpness ring setting in place.
6. Mount the optics protective hood.

Variants with C-mount lens:

Adjusting the brightness and sharpness

1. Remove the ring lighting and optics protective cap.
2. Mount and connect the ring lighting.
3. Select and activate ring lighting in SOPAS ET.

4. Mount and connect the ring lighting.
5. Adjust the aperture using the aperture ring (top ring) on the lens to a low value such as 2.
6. In SOPAS ET, reduce the shutter time and brightness until the test code is clearly visible on the image.
7. Increase the image sharpness using the sharpness ring (bottom ring) on the lens until the sharpness diagnosis bar reaches its maximum position. The code in the image must be clearly displayed in sharp focus, and the edges must be easy to identify.
8. Use the lock nut fitting to fix the sharpness ring setting in place.
9. Set the correct aperture adjustment for depth of field. To do this, check the settings using a test code. Adjust the aperture to a higher value, such as 8. If a greater depth of field is required, select a value higher than 8. Bear in mind that using a greater aperture value reduces image brightness, meaning that brightness in SOPAS ET must be increased using the brightness slider. This reduces image quality.
10. Fix the aperture ring using the lock nut fitting.
11. Remove the ring lighting.
12. Mount the optics protective hood.
13. Mount and connect the ring lighting.

Continuing and saving configuration:

1. Go to the image display window (Oxine image), click the 9 Teach-in 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)**

- External illumination connection
- Gigabit Ethernet connection
- USB connection
- Power, serial, CAN, and I/O connection
- Optics protective hood: length 22.7 mm, 37.7 mm, or 60 mm
- Protective caps or plugs for closing off electrical connections that are not in use
- 55 blind tapped holes, 5.5 mm deep (x), for mounting the device
- Sliding nut M5, 5.5 mm deep (x), pivoting, alternative method of mounting the device
- Integral illumination connection
- Aiming laser (2 x)
- 5 or C-mount optics module
- Blind tapped holes, 2.5 mm (4 x) for mounting the spacers for the integral illumination unit
- Optical axis and center of the image sensor
- Manual focus screw, underneath cover (label) (S-mount)
- Function keys (2 x)
- LED bar graph (5 x)
- Removable cover for microSD memory card and manual focus screw (S-mount)
- LEDs for status indicator (5 x 2 levels)

**Integrable illumination unit**

In the finished variant, the integrable illumination unit is already assembled. In the modular variant, you must order an integrable illumination unit (W551 ring illumination) separately and assemble it yourself.

![Integrable illumination unit](image)

**Operating and status indicators**

1. **Arrow button**
2. **Return button**

**Status indicators in read mode**

<table>
<thead>
<tr>
<th>Display</th>
<th>LED</th>
<th>Color</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready</td>
<td>Green</td>
<td>Device ready for reading</td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td>Green</td>
<td>Read operation successful</td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>Green</td>
<td>Read mode: illumination on, internal reading interval open</td>
<td></td>
</tr>
</tbody>
</table>

- **illuminated:**  
- **flashing**

Tab. 1: Status indicators on the first display level

**Test (reading dia/gnostics)**

Percentage analysis: The device records a series of images and uses the current reading performance settings to decode them. The read rate of the last 10 read operations is displayed in % using the bar graph.

**Teach-in**

When you teach-in a match code, the device reads the code that is presented and saves it permanently (in accordance with the default setting) as a target code for future code comparisons during read mode. Pharmacode is only supported following activation with SOPAS ET.

**Setup**

The device adjusts itself automatically to suit the lighting conditions and quality of the code presented. It saves the calculated values permanently in accordance with the default setting.

**Overview of electrical connections**

See "Overview of design of connections and pin assignment" on page 8.

**MicroSD memory card (optional accessory)**

**Function**

With the optional plug-in memory card, the device backs up the last permanently saved parameter set externally as well (cloning). Furthermore, the device has the option of recording images, e.g., in the case of "no reads." For the parameter safety concept and other functions of the memory card, refer to the online help for the device.

The memory card is not included with delivery. To ensure that the memory card functions reliably, only use types approved by SICK (see accessories on www.sick.com/Lector63x). The device supports memory cards up to max. 32 GB. The memory card has no write protection that can be activated.

**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 Accessory 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 side of the device with the operating elements.

Maintenance and care

Compliance with enclosure rating IP 67:
See “Safety information” on page 1.

“Device structure (camera housing)” on page 4.

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.

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 or 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, vibration as possible, relative air humidity max. 90%.

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 C-mount quickstart in German (part no. 8019140) and English (part no. 8019141) and possibly other languages as well.
• Lector63x Flex operating instructions in German (part no. 8018070), English (part no. 8018071) 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)

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).

Reparis

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 C-mount quickstart in German (part no. 8019140) and English (part no. 8019141) and possibly other languages as well.
• Lector63x Flex operating instructions in German (part no. 8018070), English (part no. 8018071) 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

C6FD600-21xx PROFIBUS DP fieldbus module
www.sick.com/C6FD600-2

• Fieldbus module C6FD600-21xx PROFIBUS DP operating instructions in German (part no. 8015334) and English (part no. 8015335), in other languages if required
• Technical information for the C6FD600-21xx PROFIBUS DP fieldbus module in German (part no. 8015336) and English (part no. 8015337)

C6FD600-22xx PROFINET fieldbus module
www.sick.com/C6FD600-2

• Fieldbus module C6FD600-22xx PROFINET (M12 variant) operating instructions in German (part no. 8015921) and English (part no. 8015922), in other languages if required
• Fieldbus module C6FD600-22xx PROFINET technical information 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.

This program is provided for general use, but WITHOUT ANY WARRANTY OF ANY KIND. This warranty disclaimer also extends to the implicit assurance of marketability or suitability of the program for a particular purpose.

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)

Type Lector63x Flex

- Lens type, focus setting
  • C-mount lens: manual adjustment of the sharpness and aperture on the lens unit
  • Compact C-mount lens: fixed aperture, manual adjustment of the sharpness on the lens unit

Illumination for field of view
Optional by means of, e.g., variants of the V155I integrable illumination unit: 6 LEDs, visible light, switchable.
• White (T = 6,000 ± 500 K)
• Blue (λ = 455 ± 20 nm)

Feedback LED (spot in field of view)
Optional by means of, e.g., variants of the V155I integrable illumination unit: 1 LED, visible light.
• Green (λ = 525 ± 15 nm), RG 1
• Red (λ = 630 ± 20 nm), RG 1

LED risk group of V155I integrable illumination unit
Risk group 1: “White + feedback LED” option (part no. 2078428, part no. 2078430, part no. 2078431)
Blue – medium + feedback LED (part no. 2083814)
Blue – wide + feedback LED (part no. 2083813)

Risk group 1 (low risk) according to IEC 62471-1: 2006-07/EN 62471-1: 2008-09.
• Radiance: Lc < 10 x 10^-5 W/(m2sr) within 100 s; at a distance of ≥ 200 mm
• Lc < 7 x 10^-5 W/(m2sr) within 10 s; at a distance of ≥ 200 mm

Risk group 2:
Blue – narrow (part no. 2083812):
• Risk group RG 2 (moderate risk) according to IEC 62471-1: 2006-07/EN 62471-1: 2008-09 due to exposure to blue light.
• Radiance: Lc < 10 x 10^-5 W/(m2sr) within 50 s (RG 2) at a distance of ≥ 200 mm
• Lc < 7 x 10^-5 W/(m2sr) within 10 s (RG 1) at a distance of ≥ 200 mm
• Risk group RG 1 (low risk) corresponding to Lc < 10 x 10^-5 W/(m2sr) within 100 s for distances > 1 m

Aiming lasers (field of view)
Visible light, Red (λ = 630 nm ... 680 nm), can be disengaged
### Code resolution
- ≥ 0.05 mm, depending on lens unit

### Working distance
- See Fig. 10 on page 7 and Fig. 11 on page 7.

### Lens unit
- Interchangeable, see product information for the Lector series (part no. 8016252).
- Modular variant: to be mounted by SICK
- 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
- Data Matrix eCC200, GS1 Data Matrix, AUX (USB 2.0), for configuration/diagnostics.
- USB AUX (57.6 kBd), for configuration/diagnostics and image transmission
- Internal RAM (512 MB), and external FTP.

### Data storage and retrieval
- Image and data logging via microSD memory card (max. 32 GB), internal RAM.
- External backup of configuration data.

### Serial ports
- RS-232/422 Host (300 Bd ... 115.2 kBd), for data output
- RS-232 AUX (57.6 kBd), for configuration/diagnostics
- USB AUX (USB 2.0), for configuration/diagnostics and image transmission

### Ethernet
- AUX, Host, image transmission (FTP), 10/100, TCP/IP, Ethernet

### Image sensor
- Monochrome

### Laser class
- Class 1 according to EN/IEC 60825-1:2014 (identical to EN/IEC 60825-1:2007).

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

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

---

### Table: Technical data

<table>
<thead>
<tr>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Function</td>
</tr>
<tr>
<td>10</td>
<td>Illumination</td>
</tr>
<tr>
<td>11</td>
<td>Lens type and aperture value</td>
</tr>
<tr>
<td>13</td>
<td>Connection variant</td>
</tr>
<tr>
<td>14</td>
<td>IP protection class and front screen of optics protective hood</td>
</tr>
</tbody>
</table>

1. See “Overview of design of connections and pin assignment” on page 8.
2. Compliance with enclosure rating IP 67. See “Safety information” on page 1.

### Lector63x Flex

<table>
<thead>
<tr>
<th>Material housing</th>
<th>Aluminum die cast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material reading window</td>
<td>Glass or plastic (PMMA), 2 mm thick, with scratch-proof coating</td>
</tr>
<tr>
<td>Electrical protection class</td>
<td>III (EN60950-1:2014-08)</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Operation: 0 °C ... +50 °C, Storage: -20 °C ... +70 °C</td>
</tr>
<tr>
<td>Allowable relative humidity</td>
<td>0% ... 90%, non-condensing</td>
</tr>
</tbody>
</table>

### 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.

### V 2 D 6 3 x R – M x x x x x

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>D</td>
<td>E</td>
<td>C</td>
<td>B</td>
<td>A</td>
<td>M</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

1. 20 kbit/s, ≤ 1 Mbit/s
2. Protocol: SICK CAN sensor network
3. Optional via external fieldbus module
4. CAN 20 kbit/s ... 1 Mbit/s
5. with scratch-proof coating
6. IP protection class and front screen of optics protective hood
7. Reading (Standard 1D/2D-decoder, DPM decoder, OCR)
8. See “Overview of design of connections and pin assignment” on page 8.
9. Monochrome
10. No illumination unit installed
11. Visible light laser, lens mounted by SICK
12. C-mount module, without lens
13. See “Overview of design of connections and pin assignment” on page 8.
### Designation

<table>
<thead>
<tr>
<th>Supply voltage V&lt;sub&gt;s&lt;/sub&gt; in [DC V]</th>
<th>9.6 (12 V -20 %)</th>
<th>12</th>
<th>24</th>
<th>28.8 (24 V +20 %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. supply current (2 A protection)</td>
<td>( l_{\text{max}, \text{sup}} ) [A]</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### Current consumption of device

- **Standby**
  - \( l_{\text{sup}} \) [A]: 0.58
  - \( l_{\text{sup}} \) [A]: 0.47
  - \( l_{\text{sup}} \) [A]: 0.24
  - \( l_{\text{sup}} \) [A]: 0.21

- **Internal illumination off**
  - \( l_{\text{int}, \text{off}} \) [A]: 0.86
  - \( l_{\text{int}, \text{off}} \) [A]: 0.68
  - \( l_{\text{int}, \text{off}} \) [A]: 0.35
  - \( l_{\text{int}, \text{off}} \) [A]: 0.30

- **Internal illumination on**
  - \( l_{\text{int}, \text{on}} \) [A]: 1.09
  - \( l_{\text{int}, \text{on}} \) [A]: 0.90
  - \( l_{\text{int}, \text{on}} \) [A]: 0.45
  - \( l_{\text{int}, \text{on}} \) [A]: 0.36

- **Typical, all 4 switching outputs loaded (0.1 A per output)**
  - \( l_{\text{out}, \text{int}, \text{on}} \) [A]: 1.26
  - \( l_{\text{out}, \text{int}, \text{on}} \) [A]: 1.08
  - \( l_{\text{out}, \text{int}, \text{on}} \) [A]: 0.75
  - \( l_{\text{out}, \text{int}, \text{on}} \) [A]: 0.70

### Power loss

**Internal illumination on**
- \( P_{\text{int}} \) [W]: 8.3
- \( P_{\text{int}} \) [W]: 8.2
- \( P_{\text{int}} \) [W]: 8.4
- \( P_{\text{int}} \) [W]: 8.7

### Maximum current consumption of external illumination via “External illumination” connection unit on device

- **Switching outputs without load**
  - \( l_{\text{ext}, \text{int}, \text{on}} \) [A]: 0.64
  - \( l_{\text{ext}, \text{int}, \text{on}} \) [A]: 0.65
  - \( l_{\text{ext}, \text{int}, \text{on}} \) [A]: 0.65

- **All 4 switching outputs loaded (0.1 A per output)**
  - \( l_{\text{ext}, \text{int}, \text{on}} \) [A]: 0.24
  - \( l_{\text{ext}, \text{int}, \text{on}} \) [A]: 0.42
  - \( l_{\text{ext}, \text{int}, \text{on}} \) [A]: 0.65

### Field of view diagram for Lector631 (1.3 Mpx) C-mount

**Fig. 10:** Field of view diagram for Lector631 Flex C-mount, field of view: width x height, typical values

### 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 \( 2 \): 16.0 mm

- **Read out (in green):**
  - Maximum working distance \( 3 \): 1,800 mm
  - Field of view \( V_{2D, 632} \) \( 4 \):

  Field of view: approx. 800 mm x 600 mm

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

**Fig. 11:** Field of view diagram for Lector632 Flex C-mount, field of view: width x height, typical values

### Field of view in mm²

<table>
<thead>
<tr>
<th>Working distance/focus position in mm</th>
<th>0</th>
<th>200</th>
<th>400</th>
<th>600</th>
<th>800</th>
<th>1000</th>
<th>1200</th>
<th>1400</th>
<th>1600</th>
<th>1800</th>
<th>2000</th>
<th>2200</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 x 160</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 x 320</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600 x 480</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800 x 640</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000 x 800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200 x 960</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Designation

<table>
<thead>
<tr>
<th>Power loss Internal illumination on</th>
<th>( P_{\text{int}} ) [W]</th>
<th>( P_{\text{int}} ) [W]</th>
<th>( P_{\text{int}} ) [W]</th>
<th>( P_{\text{int}} ) [W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 8.3 )</td>
<td>( 8.2 )</td>
<td>( 8.4 )</td>
<td>( 8.7 )</td>
<td></td>
</tr>
</tbody>
</table>

1) For configuration of cables and fuses.  
2) For configuration of the power supply unit.  
3) Illumination units with a higher current consumption cannot be used, peak currents may, however, be higher. Output current limited internally by way of a PTC resistor to 0.65 A RMS.

*Tab. 3: Detailed information on current consumption and power loss*
Overview of design of connections and pin assignment

<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 ¹</td>
<td>TRD0_P</td>
</tr>
<tr>
<td>2</td>
<td>Supply voltage V_s</td>
<td>Data-</td>
<td>Trigger illumination</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>-</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>-</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>


The pins are assigned internally in the device by selecting the ICL or VLR illumination with SOPAS ET configuration software.

Overview of application examples

Fig. 12: Application examples for the Lector63x Flex

Assembly of variants with compact C-mount lenses

Fig. 13: Assembly of Lector63x Flex with compact C-mount lens

1. Camera housing
2. Spacer for integrable illumination unit (4 x)
3. Illumination unit connector
4. Optical filter (optional)
5. Spacer disk (included with delivery of filter)
6. Compact C-mount lens
7. Integrable illumination unit (VI55I)
8. C-mount filter (optional), cannot be used with 15 mm lenses (part no. 2080213)
9. Filter holder
10. Optics protective hood

Assembly of variants with C-mount lenses

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

1. Camera housing
2. C-mount filter (optional)
3. Spacer disk (included with delivery of filter)
4. C-mount lens
5. Mounting bracket for ICL ring lighting (2 x)
6. Lens protective hood for ICL ring lighting
7. ICL ring lighting