



Lector63x Flex S-mount

Image-based code reader
with manually adjustable focus

SICK
Sensor Intelligence.



Intended use

The Lector63x Flex image-based code reader with integrated illumination is an intelligent SICK-4Dpro sensor. It is used for automatic, fixed identification and decoding of codes on moving or stationary objects. The Lector63x Flex reads all commonly used 1D codes (bar codes/stacked codes) and 2D codes (matrix codes). The Lector63x Flex uses its host interface to send the read data to a higher-level computer for further processing.

The Lector63x Flex is available as a finished variant and modular variant. In the finished variant, the Lector63x Flex is assembled by SICK. In the modular variant, you assemble the Lector63x Flex individually to make a complete system that suits your intended application from the following components: camera housing, lens, illumination unit, optics protective hood, and, depending on the composition, spacer, illumination unit connector, spacer ring, and filter. We recommend only using products from SICK as components.

About this document

In this document, the Lector63x Flex is referred to in simplified form as a "device."

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

Important information on the VI55I integrable illumination unit and its LEDs in risk groups RG 1 or RG 2 can be found in [Technical Information VI55I illumination unit device \(part no. 8018486\)](#).

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 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 and 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.

→ See [Technical Information VI55I illumination unit device \(part no. 8018486\)](#).

Laser radiation

Aiming lasers

CAUTION

Optical radiation: Class 1 laser

The accessible radiation of the aiming lasers does not pose a danger when viewed directly for up to 100 seconds. It may pose a danger to the eyes and skin in the event of incorrect use.

- 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

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.
- 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 will not switch off the light source. 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, illumination unit, 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.

- 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 for 65 Ncm

Assembling modular variants with S-mount lenses

→ See Fig. 14 on page 8.

Important!

Depending on the variant, mounting spacers and an illumination unit connector may be necessary. See “selection guide” online. Path: www.sick.com/Lector63x > Select sensor > “Technical details” tab > “Technical drawings” section

Mount the spacer ring, 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. Depending on the lens used and the desired working distance, one or more spacer rings may need to be mounted below the lens. The spacer rings come in parcels (part number 2066933 and 2081458).

Working distance in mm	Spacer ring in mm		
	Focal distance of lens		
	9.6 mm	17.5 mm	25 mm
50 ... 65	– ¹⁾	2.3 + 3 ²⁾	³⁾
60 ... 95	– ¹⁾	1.5 + 2.3 ²⁾	³⁾
70 ... 90	– ¹⁾	2.3	1.5 + 1.5 + 1.5 + 3
80 ... 100	– ¹⁾	2.3	1.5 + 2.3 + 3
90 ... 120	– ¹⁾	1.5	2.3 + 3
100 ... 130	– ¹⁾	1.5	1.5 + 3
110 ... 170	– ¹⁾	1.5	1.5 + 2.3

Working distance in mm	Spacer ring in mm		
	Focal distance of lens		
	9.6 mm	17.5 mm	25 mm
150 ... 210	– ¹⁾	– ¹⁾	3
> 210	– ¹⁾	– ¹⁾	– ¹⁾

- 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. Screw in the lens unit until the stop point is reached and the thicker part of the lens is inside the light inlet of the camera housing. If the lens is only screwed in to cover its thread length, the lens is not tightly screwed into the camera housing.

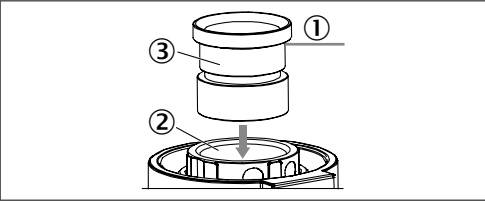


Fig. 1: Screwing in the S-mount lens

- ① Stop point: Screw the lens unit in until the stop point is reached
 - ② Light inlet
 - ③ S-mount lens
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. Use Allen wrench, size 2, for this purpose.
 8. Mount the optional filter and filter holder.
 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 VI55I illumination unit device (part number 8018486).

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

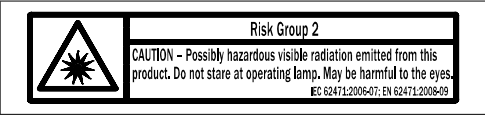


Fig. 2: LED risk group 2 warning label:

Risk group 2 CAUTION – potentially hazardous optical radiation due to this product. Do not look into the lamp for extended periods of time during operation. Can be damaging to the eyes.
ICE 62471:2006-07; EN 62471:2008-09

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

- 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 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.

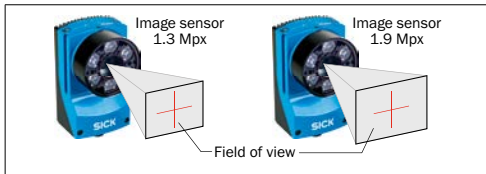


Fig. 3: Image sensor-dependent viewing ranges in front of the device; size stretching is distance-dependent

Taking account of the working distance, depending on the resolution

Resulting reading ranges: → See Fig. 11 on page 7 and Fig. 12 on page 7.

Taking account of the reading angle

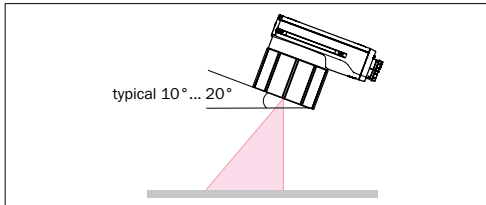


Fig. 4: Selection of the skew angle, depending on the application

- 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.

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).

⚠ 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.

1. Connect the communication interface of the device to the PC (Ethernet or USB).
2. Supply the device with voltage as per the type label specifications.

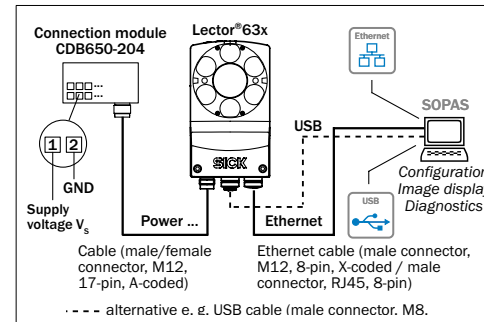


Fig. 5: Block wiring diagram for commissioning a Lector63x Flex (V2D63xR-MxxxBx)

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.
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.



Fig. 6: SOPAS ET program window example

- ① “Wizard and help” area
- ② “Image display” area
- ③ “Configuration” area

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 EDIT 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.

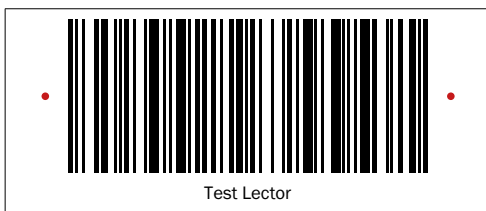




Fig. 7: Test code and both light points of the aiming lasers

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)

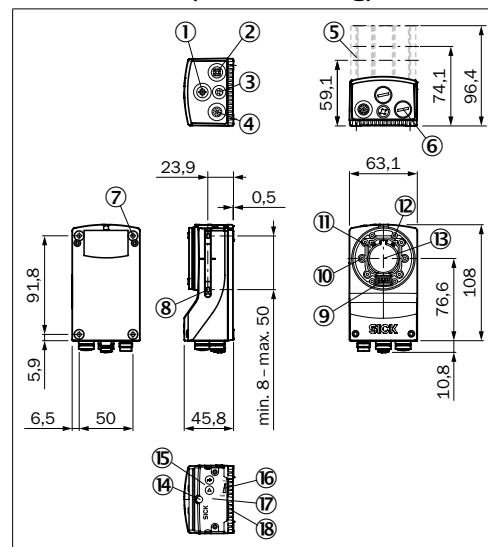


Fig. 8: Lector63x Flex structure (camera housing)
(all dimensions in mm)

- ① External illumination connection
- ② Gigabit Ethernet connection
- ③ USB connection
- ④ Power, serial, CAN, and I/O connection
- ⑤ 22.7 mm, 37.7 mm, or 60 mm optics protective hood
- ⑥ Protective caps or plugs for closing off electrical connections that are not in use
- ⑦ M5 blind tapped holes, 5.5 mm deep (4 x), for mounting the device
- ⑧ Sliding nut M5, 5.5 mm deep (4 x), pivoting, alternative method of mounting the device
- ⑨ Integrable illumination connection
- ⑩ Aiming laser (2 x)
- ⑪ S or C-mount optics module
- ⑫ Blind tapped holes, 2.5 mm (4 x) for mounting the spacers for the integrable illumination unit
- ⑬ Optical axis and center of the image sensor
- ⑭ Manual focus screw, underneath cover/label (S-mount)
- ⑮ Function keys (2 x)
- ⑯ LED bar graph (5 x)
- ⑰ Removable cover for microSD memory card and manual focus screw (S-mount)
- ⑱ 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 VI55I integrable illumination unit separately and assemble it yourself.

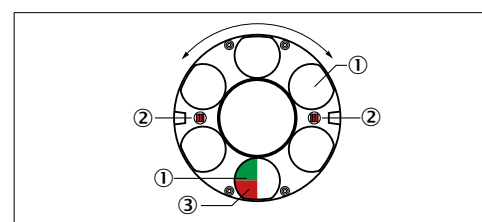


Fig. 9: Integrable illumination unit

- ① Illumination via 6 LEDs
- ② 2 openings in the illumination unit for the aiming laser for alignment: Both red laser LEDs can be switched off and each generate a red point on the object within the field of view
- ③ Feedback LED, green ("Good Read") or red ("No Read"); can be switched via software; after a successful read operation (default) it briefly generates a light spot on the object within the field of view

Operating and status indicators

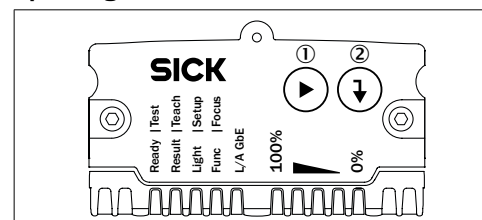


Fig. 10: LED status indicators, function keys, and bar graph

- ① Arrow button
- ② Return button

Status indicators in read mode

Display	LED	Color	Status
Ready	●	Green	Device ready for reading
	●	Red	Hardware or software error
Result	●	Green	Read operation successful
	●	Red	Read operation unsuccessful
Light	●	Green	Read mode: illumination on, internal reading interval open

● = illuminated; ● = flashing

Tab. 2: Status indicators on the first display level

Test (reading diagnostics)

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 under 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 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.

- Loosen the two Allen screws on the cover using the Allen wrench, size 2.
- Push the cover away from the device until the card slot can be accessed.
- 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.
- 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 RG 2 for the illumination unit.

- 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 part no. 8019142) and English (part no. 8019143) 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

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

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Technical data (excerpt)

Type	Lector63x Flex
Lens type, focus setting	• S-mount lens: fixed aperture, short working distances possible using spacer ring, manual adjustment of the sharpness using focus screw
Illumination for field of view	Optional by means of, e.g., variants of the VI55I 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 VI55I 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 VI55I 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: • $L_b < 10 \times 10^3 \text{ W/(m}^2\text{sr)}$ within 100 s; at a distance of $\geq 200 \text{ mm}$ • $L_r < 7 \times 10^3 \text{ W/(m}^2\text{sr)}$ within 10 s; at a distance of $\geq 200 \text{ mm}$ 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: • $L_b < 10 \times 10^3 \text{ W/(m}^2\text{sr)}$ within 50 s (RG 2) at a distance of $\geq 200 \text{ mm}$ • $L_r < 7 \times 10^3 \text{ W/(m}^2\text{sr)}$ within 10 s (RG 1) at a distance of $\geq 200 \text{ mm}$ • Risk group RG 1 (low risk) corresponding to $L_b < 10 \times 10^3 \text{ W/(m}^2\text{sr)}$ within 100 s for distances $> 1 \text{ m}$
Aiming laser (field of view)	Visible light. Red (λ = 630 nm ... 680 nm), can be disengaged

Type	Lector63x Flex
Laser class	Class 1 according to EN/IEC 60825-1: 2014 (identical to EN/IEC 60825-1: 2007). Complies with 21 CFR 1040.10 except for tolerances according to Laser Notice no. 50 of June 24, 2007 and its following versions.
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	<ul style="list-style-type: none">Interchangeable, → see product information for the Lector series (part no. 8016252)Assembled variants:<ul style="list-style-type: none">lens mounted by SICKModular 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	<ul style="list-style-type: none">1.3 Mpx: 50 Hz1.9 Mpx: 50 Hz
Bar code types (1D)	2/5 Interleaved, Codabar, Code 128, Code 32, Code 39, Code 93, GS1 DataBar GS1-128/EAN 128, Pharma-code, UPC/GTIN/EAN
Postal codes	Postnet, Planet, USPS 4SCB, Australia Post, Post Netherlands, Royal Mail, Post Sweden
2D code types	Data Matrix ECC200, GS1 Data Matrix, MaxiCode, PDF417, QR code
Code qualification	Based on ISO/IEC 16022, ISO/IEC 15415, ISO/IEC 15416, ISO/IEC 18004
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 Bd ... 115.2 kBd), for data output
Serial 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). 10/100/1,000 Mbit/s, TCP/IP, Ethernet/IP. MAC address(es), see type label.

Type	Lector63x Flex
CAN	20 kbit/s ... 1 Mbit/s Protocol: SICK CAN sensor network
PROFIBUS	Optional via external fieldbus module CDF600-21xx
PROFINET	Optional via external fieldbus module CDF600-22xx
Digital switching inputs	<ul style="list-style-type: none">2 x physical2 x additional external via optional CMC600 module in connection module CDB650-204 or CDM420-0006V_{in} = max. 32 V, I_{in} = max. 5 mA, opto-decoupled, reverse polarity protected, adjustable debounce time
Digital switching outputs	<ul style="list-style-type: none">4 x physical2 x additional external via optional CMC600 module in connection module CDB650-204 or CDM420-0006V_{out} = V_G - 1.5 V, I_{out} ≤ 100 mA. Short-circuit protected, temperature protected. Not galvanically isolated from the supply voltage.
Electrical connections	→ See "Overview of design of connections and pin assignment" on page 8.
Optical indicators	<ul style="list-style-type: none">5 x RGB LEDs: status indicators1 x LED: feedback LED, green/red5 x RGB LEDs: bar graph, blue
Operating elements	2 function keys
Acoustic indicators	1 x beeper for signaling events, can be deactivated
External backup of configuration data	Optional on plug-in microSD memory card or via optional CMC600 module in connection module CDB650-204 or CDM420-0006.
Supply voltage V_s	DC 12 V ... 24 V ± 20%, SELV (DIN EN 60950-1:2014-08), LPS (DIN EN 60950-1:2014-08) or Class 2 (UL 1310)
Current consumption	Max. 1.5 A (with switching outputs) → See "Tab. 4: Detailed information on current consumption and power loss" on page 7
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	Lector63x Flex
Material reading window	→ See "Type code" on page 6. Glass or plastic (PMMA), 2 mm thick, with scratch-proof coating
Electrical protection class	III (DIN EN 60950-1:2014-08)
Enclosure rating	→ See "Type code" on page 6. <ul style="list-style-type: none">According to EN 60529:2000-09Compliance with enclosure rating: → See "Safety information" on page 1.
Vibration resistance/shock resistance	<ul style="list-style-type: none">According to EN 60068-2-6:2008-02According to EN 60068-2-27:2009-05
EMC	<ul style="list-style-type: none">Electromagnetic immunity: EN 61000-6-2: 2005-08-01Radiated emission: EN 61000-6-4:2007-01-01 + EN 61000-6-4/A1:2011-02-01
Ambient temperature	<ul style="list-style-type: none">Operation ¹⁾: 0 °C ... +50 °CStorage -20 °C ... +70 °C
Permissible relative humidity	0% ... 90%, non-condensing

1) Notes regarding adequate dissipation of lost heat: → See "Mounting requirements" on page 2.

Tab. 3: Technical data

For further technical specifications, see the online data sheet on the product page on the Internet:
www.sick.com/Lector63x

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
1	2	3	4	5	6	7		8	9	10	11	12	13	14

Position	Description
1 ... 5	Product family V2D63 Lector63x
6	Image sensor resolution 1 1.3 megapixels (1,280 px x 1,024 px) 2 1.9 megapixels (1,600 px x 1,200 px)

Position	Description
7	Function R Reading (Standard 1D/2D-decoder) D Reading (Standard 1D/2D-decoder, DPM decoder, OCR)
9	Image sensor type M Monochrome
9	Illumination X No illumination unit installed I White wide K White medium W White narrow N Blue wide P Blue medium B Blue narrow
11 - 12	Lens type and aperture value CX C-mount module, without lens Variants with C-mount lens: CA 6 mm (f1.4 - 16) CB 8 mm (f1.4 - 16) CD 12 mm (f1.4 - 16) CE 16 mm (f1.4 - 16) CF 25 mm (f1.4 - 16) CG 35 mm (f1.4 - 16) CH 50 mm (f1.4 - 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 Variants with S-mount lens: SC 9.6 mm (f8) SD 12.5 mm (f8) SE 17.5 mm (f8) SF 25 mm (f8)
13	Connection variant ¹⁾ B Standalone USB, CAN, serial, I/O, Ethernet
14	IP protection class and front screen of the optics protective hood ²⁾ 5 IP 67, plastic front screen 6 IP 67, glass front screen

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.
The optics protective hood must be ordered separately in the appropriate length for the following modular variants: V2D63xR-MxCxBx, V2D63xR-MxMxBx, and V2D63xR-MxSxBx.

Designation		Supply voltage V _s in [DC V]			
		9.6 (12 V -20 %)	12	24	28.8 (24 V +20 %)
Max. supply current (2 A protection)	I _{RMS max} ¹⁾ [A]	1.5	1.5	1.5	1.5
Current consumption of device					
Standby	I _{B RMS} [A]	0.58	0.47	0.24	0.21
Internal illumination off	I _{B RMS} [A]	0.86	0.68	0.35	0.30
Internal illumination on	I _{B peak} ²⁾ [A]	1.09	0.90	0.45	0.36
Typical, all 4 switching outputs loaded (0.1 A per output)	I _{B RMS 4 OUT} [A]	1.26	1.08	0.75	0.70
Power loss Internal illumination on	P _{RMS} [W] P _{eff} [W]	8.3	8.2	8.4	8.7
Maximum current consumption of external illumination via "External illumination" connection unit on device ³⁾					
Switching outputs without load	I _{B RMS max} [A]	0.64	0.65	0.65	0.65
All 4 switching outputs loaded (0.1 A per output)	I _{B RMS max 4 OUT} [A]	0.24	0.42	0.65	0.65

- 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. 4: Detailed information on current consumption and power loss

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

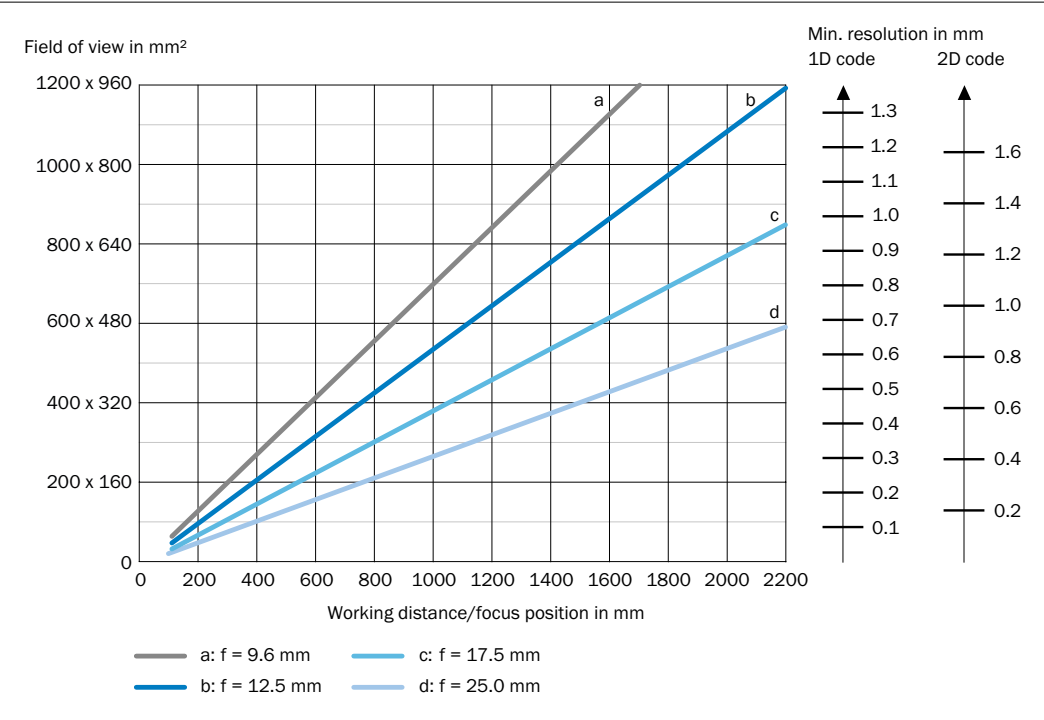


Fig. 11: Field of view diagram for Lector631 Flex S-mount, field of view: width x height, typical values

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: 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 diagram for Lector632 (1.9 Mpx) S-mount

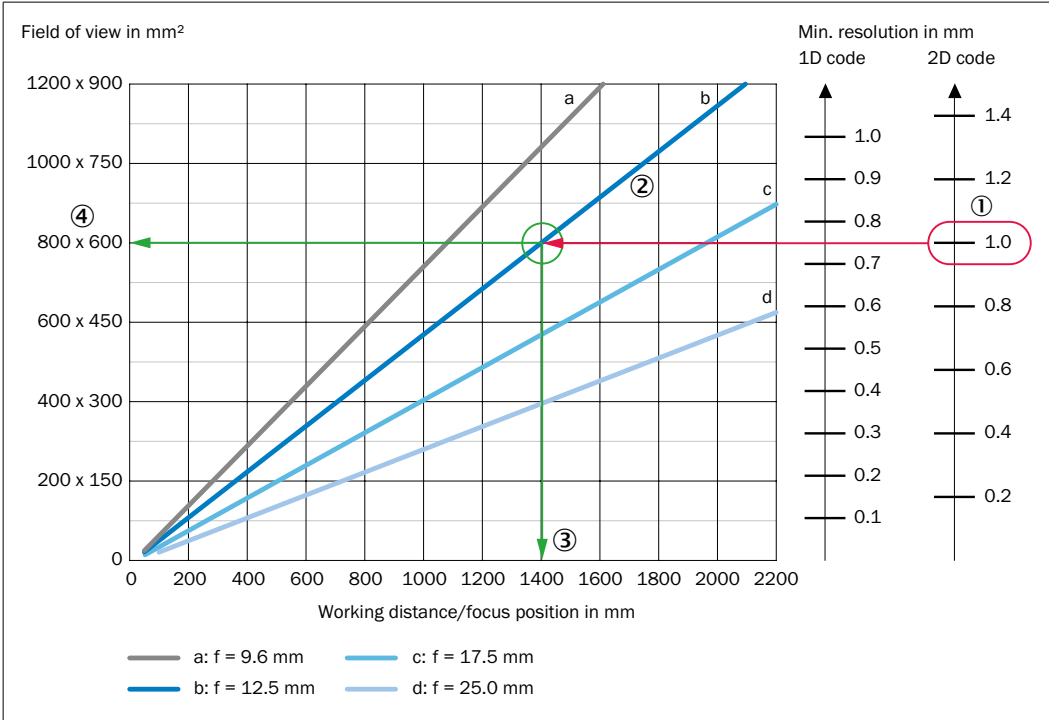
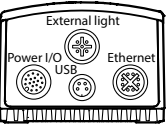
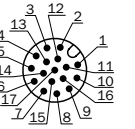


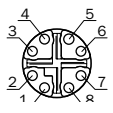


Fig. 12: Field of view diagram for Lector632 Flex S-mount, field of view: width x height, typical values

Overview of design of connections and pin assignment

	Power, I/O, SerialData, CAN	USB	External illumination connection	GB Ethernet
				
	Male connector, M12, 17-pin, A-coded	Female connector, M8, 4-pin	Female connector, M12, 4-pin, A-coded	Female connector, M12, 8-pin, X-coded
Pin	Signal	Signal	Signal	Signal
1	GND	+5 V	V _s switchable output	TRD0_P
2	Supply voltage V _s	Data-	Trigger illumination DC V _s	TRD0_N
3	CAN L	Data+	GND	TRD1_P
4	CAN H	GND	-	TRD1_N
5	TD+ (RS-422), Host	-	-	TRD3_P
6	TD- (RS-422), Host TxD (RS-232), Host	-	-	TRD3_N
7	TxD (RS-232), Aux	-	-	TRD2_P
8	RxD (RS-232), Aux	-	-	TRD2_N
9	SensGND	-	-	-
10	Sensor 1, switching input	-	-	-
11	RD+ (RS-422), Host	-	-	-
12	RD- (RS-422), Host RxD (RS-232), Host	-	-	-
13	Result 1, switching output	-	-	-
14	Result 2, switching output	-	-	-
15	Sensor 2, switching input	-	-	-
16	Result 3, switching output	-	-	-
17	Result 4, switching output	-	-	-

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

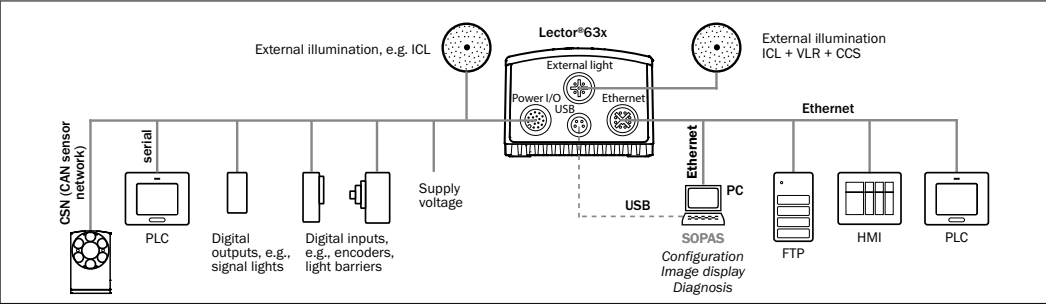


Fig. 13: Application examples for the Lector63x Flex

Assembly of variants with S-mount lenses

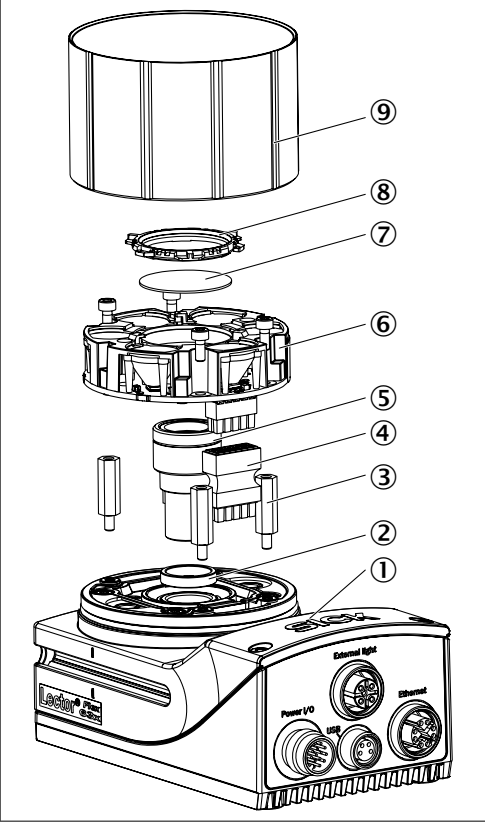


Fig. 14: Assembly of Lector63x Flex with S-mount lens

- 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