The Lector®65x product family includes two distinct version series: Dynamic Focus and Flex. Depending on the particular model, the version series offer different options in terms of the following:

- Sensor resolution and image frame rate of imager
- Type and focal distance of lens unit
- Light color of integrated/integrable illumination unit
- Type and combination of electrical connections
- Device enclosure rating and type of material used for the reading window in the optics protective hood

About this document

The purpose of these operating instructions is to allow you to put the Lector®65x Flex into operation quickly and easily and to achieve initial read results. These instructions describe a stand-alone application for a Lector®65x Flex based on the default settings. The device used in this scenario could, for example, take the form of a Lector®65x Flex (model name V2D65XR-M0X6x; sensor resolution 4 megapixels) plus optional optic kit 05. The kit comprises:

- C-mount lens unit with a focal distance of 50 mm, integrable Vi83i illumination (ring light) with white LED light, 2 spacers, and an IP 65 optics protective hood with a glass reading window.
- The optional CDB650-204 connection module can be used to achieve industrial-standard signal distribution with the Lector®65x Flex.

The operating instructions are valid for the following variants: Connection variant 1:

- Lector®65x Flex, model name V2D65XR-M0X6x
- Lector®65x Flex, model name V2D65XR-M0X6x

Connection variant 2, for Systems:

- Lector®65x Flex, model name V2D65XR-M0X6x
- Lector®65x Flex, model name V2D65XR-M0X6x

For the exact features, see “Device overview”, page 5.

For the sake of simplicity, the Lector®65x Flex with a mounted optic kit will be referred to below as the “Lector®65x”.

Supplementary and applicable documents

More detailed information about mounting and electrical installation as a stand-alone device in accordance with these operating instructions is available in the Lector®65x Technical Information (no. 8016185). This technical information describes and presents:

- Optional mounting accessories (brackets)
- The suppression of possible ground potential equalization currents in applications with distributed systems
- Pin assignments and lead color assignments of cables
- Electrical wiring diagrams for the CDB650-204/CDM420-0006 connection modules (in relation to the Lector®65x)
- Overview list and license texts for open-source software
- Important information on the Vi83i illumination unit and its variant-dependent LEDs in risk groups R1 or R2 is contained in the Notes on device of Vi83i illumination unit (no. 8017270), Hard copy enclosed with the illumination unit.

Information about configuring the Lector®65x can be found in the online help function of the SOPAS ET configuration software.

The documents are available on the web in PDF format. Simply visit the SICK product page for the Lector®65x:

www.mysick.com/en/lector65x

Safety information

This chapter is about the safety of commissioning personnel, as well as operators of the system in which the Lector®65x is integrated.

- Read these instructions carefully before commissioning the Lector®65x in order to familiarize yourself with the device and its functions. The operating instructions are considered a part of the device and must be kept in an accessible location in the immediate vicinity of the Lector®65x at all times.
- The Lector®65x conforms to laser class 1M.
- The Vi83i integrable illumination unit contained in the optics kits conforms to LED risk group RG 1 or RG 2, depending on the variant (see “Technical specifications (exempt)”, page 5). For details of hazards and protective measures see “Optical radiation”, page 3 and Notes on device of Vi83i illumination unit.
- During operation, the surface temperature of the Lector®65x housing (particularly on the rear of the device where the cooling fins are located) can reach 70°C.
- The following requirements must be met if the IP 65 enclosure rating is to be maintained during operation (otherwise, the device will no longer meet the conditions for any specified IP enclosure rating):
  - The optics protective hood must be screwed tight.
  - The black cover for the micro SD card slot (rear of device) must be screwed tight to the device.
  - The SICK cables plugged into the M12/M8 connections must be screwed tight.
  - Electrical connections that are not being used must be fitted with yellow protective caps/plugs, which must be screwed tight (as on delivery).
- Only operate the Lector®65x without the cover for the micro SD 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 Lector®65x camera housing, which is screwed closed – including the part that holds the electrical connections – 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 Lector®65x.
- Data integrity: SICK AG uses standardized data interfaces, such as 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 the confidentiality of the data and rights which are 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 based on the situation of the risk group.

Commissioning and configuration

Scope of delivery

- The version of the Lector®65x Flex (camera housing) ordered, with a C-mount threaded connection and two M5 sliding blocks. Light inlet and electrical connections fitted with protective caps/plugs or covered by a protective sticker. Lens unit, illumination unit, optics protective hood, and connecting cables not included.
- Hexagon key, wrench size 2 for opening/closing the cover of the micro SD card slot and mounting the integrable illumination unit from the optic kit.
- SICK lens cloth no. 4003353
- Printed operating instructions in German (no. 8016180) and English (no. 8015181). Other language versions (if applicable) are available in PDF format from the online product page: www.mysick.com/en/lector65x
- Optional accessories, such as the optic kit, device bracket, and connecting cables, are only supplied if ordered separately.

Step 1: Mounting and alignment

Tools and aids required

- Two or four M5 screws for mounting the Lector®65x on a bracket supplied by the customer. Screw length is dependent on the mounting base (wall thickness of bracket). When using optional SICK brackets, screws for the Lector®65x are included with the brackets.

Mounting requirements

- The permissible ambient conditions for the operation of the Lector®65x must be observed (e. g., ambient tempera
ture, ground potential see “Technical specifications (exempt)”, page 5 and “Risk of injury/risk of damage due to electrical current”, page 2).
- 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.
- Stable bracket with sufficient load-bearing capacity and suitable dimensions for the Lector®65x. Net weight 635 g (without optic kit and cables). Dimension drawing see “Device design”, page 3
- Shock- and vibration-free mounting
- Clear view of the codes to be detected on the objects
Mounting the optic kit on the Lector®65x

Overview of how to mount the optic kit on the camera housing

Items supplied, optic kit:
• Application-specific lens unit
• Application-specific V83i illumination unit (ring light), luminated field appropriate for focal distance of lens
• Two spacers, one with a plated through connection for the electrical connection
• Screws: 4 x M2.5 x 6 mm, 4 x M2.5 x 12 mm, all screws have a cylinder head with hexagon socket, wrench size 2
• IP 65 optics protective hood with screw thread and reading window

When mounting the optic kit on the camera housing, always ensure that there is no power to the system.

1. Mounting the lens unit

2. Mounting the illumination unit (ring light)

3. If applicable, carefully insert the (optional) filter in the light inlet.

4. If necessary, use a tool to adjust the filter.

5. Mount the ring light to the camera housing.

6. Tighten the screws in the threaded mounting holes to attach each spacer.

7. Connect the designated cable(s) to the Lector®65x.

8. Ensure that the ground potential is the same at all ground connections.

9. Do not cover the image sensor (CMOS) in the light inlet.

10. When mounting the optic kit, always ensure that the environment is free of dust.

11. Do not touch the image sensor (CMOS) in the light inlet opening of the Lector®65x or the glass lenses at either end of the lens unit.

12. Place the camera housing on a non-slip base.

13. Remove the protective cap from the round light inlet.

14. Ensure that there is no power to the system.

15. When mounting the optic kit, always ensure that the environment is free of dust.

16. Do not touch the image sensor (CMOS) in the light inlet opening of the Lector®65x or the glass lenses at either end of the lens unit.

17. Peel off the white protective sticker on the camera housing that covers the electrical connection for the illumination unit.

18. Take two pairs of long screws and screw them into the threaded mounting holes to attach each spacer.

19. Screw, long (4 x)

20. Screw, short (4 x)

21. Use the 4 short screws to attach the illumination unit to the camera housing.

22. Do not mount the IP 65 optics protective hood until:
• The sharpness and aperture of the lens unit have been manually adjusted
• The setting in the display window of the SOPAS configuration software has been checked (see “Adjusting the brightness and sharpness on the lens unit”, page 3)

23. Mounting the Lector®65x

1. Connect the designated cable(s) to the Lector®65x.

2. Optionally: Attach the SICK bracket that has been ordered separately (e.g., mounting bracket no. 2069169) to the Lector®65x using the two sliding blocks.

3. Insert the screws into the threaded mounting holes/sliding blocks by a maximum of 5 mm.

4. Aligning the Lector®65x reading window with the code

   a. Remember to consider the shape and alignment of the field of view in front of the Lector®65x.

5. Taking account of the reading distance, which is dependent on resolution

   a. For the resulting reading range see “Field of view diagram”, page 5.

6. Taking account of the reading angle

   a. Selection of the skew angle, depending on the application

   b. The skew angle can be between 10° and 20°.

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

   d. For further information about aligning the field of view with the object, see the “Mounting” chapter of the Lector®65x Technical Information (no. 8016185).

7. CDB650-204 connection module

   a. Mount the CDB650-204 connection module in the vicinity of the Lector®65x.

   b. If using the serial data interfaces (RS-232), we recommend a maximum distance of 5 m. Mount the CDB650-204 in such a way that the device remains accessible at all times. In relation to this, see the CDB650-204 Connection Module Operating Instructions (no. 8016155), which are enclosed in printed form with the device.

Step 2: Electrical installation

• Only skilled electricians with appropriate training and qualifications are permitted to perform electrical installation.

• Standard safety requirements must be met when working in electrical systems.

• Electrical connections between the Lector®65x and other devices may only be made or disconnected when there is no power to the system. Otherwise, the devices may be damaged.

• Where connecting cables with one end open are concerned, make sure that bare wire ends are not touching (risk of short circuit when the supply voltage is switched on). Wires must be appropriately insulated from each other.

• Wire cross sections of the supply cable from the customer’s power system should be designed and protected in accordance with the applicable standards. If the supply voltage for the Lector®65x is not supplied via the CDB650-204 connection module, the Lector®65x must be protected by a separate slow-blow fuse with a max. rating of 2.0 A. This fuse must be located at the start of the supply circuit.

• All circuits connected to the Lector®65x must be designed as SELV circuits (SELV = Safety Extra Low Voltage).

⚠️ DANGER

Risk of injury/risk of damage due to electrical current!

The Lector®65x 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 Lector®65x can result in potential differences between the Lector®65x 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 heat rise, thereby causing cables to catch fire.

• Ensure that the ground potential is the same at all grounding points.

• If the cable insulation is damaged, disconnect the power supply immediately and have the damage repaired.

• See the “Electrical Installation” chapter in the Lector®65x Technical Information (no. 8016185) that is available on the online product page: www.mysick.com/en/lector65x

1. Connect the communication interface of the Lector®65x to the PC (Ethernet or USB, depending on model).

2. Supply the Lector®65x with a voltage of DC 24 V ± 20%.

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LECTOR®65X FLEX | SICK

8016185/Y935/2014-04-08
**Step 3: Configuration**

The SOPAS ET configuration software is used by default to adapt the Lector®65x parameters to the application and to perform diagnostics in the event of an error. The Lector®65x supports this process by displaying the images it has recorded in the SOPAS ET software (requirement concerning SOPAS ET: V. 2.38 or higher).

**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: www.mysick.com/en/SOPAS_ET by following the instructions provided there. In this case, select the "Complete" option as suggested by the install wizard. Administrator rights may be required on the PC to install the software.
2. Start the “Single Device” program option. Path: Start > Programs > SICK > SOPAS Engineering Tool > SOPAS (Single Device)
3. Establish a connection between the software and the Lector®65x via Ethernet or USB (depending on model). The connection wizard starts automatically so that you can do this.
4. The following IP address is configured by default on the Lector®65x:

```
P-Addx: 192.168.0.1
```

5. Select the appropriate Lector®65x from the list of available devices. SOPAS establishes communication with the Lector®65x and loads the associated device description file for the Lector®65x. The program window, which is divided into three sections, opens.
6. In the ONLINE IMAGE window, click the Edit button. The Lector®65x now starts recording images consecutively and uses the current settings to decode them. The effects of any lens adjustment or parameter changes in SOPAS are directly visible.

In this mode, the switching inputs and outputs are deactivated along with data output via the host interface.

**SOPAS Single Device program window**

1. Select the appropriate Lector®65x from the list of available devices.
2. Start the “Single Device” program option. Path: Start > Programs > SICK > SOPAS Engineering Tool > SOPAS (Single Device)
3. Establish a connection between the software and the Lector®65x via Ethernet or USB (depending on model). The connection wizard starts automatically so that you can do this.

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6. In the ONLINE IMAGE window, click the Edit button. The Lector®65x now starts recording images consecutively and uses the current settings to decode them. The effects of any lens adjustment or parameter changes in SOPAS are directly visible.

**Adjusting the brightness and sharpness on the lens unit**

1. Set the aperture ring (upper ring) on the lens unit to a value of 6, which is an appropriate starting value. To increase the depth of field (value <8) or the image quality (value >8), this value may need to be adjusted in conjunction with the online image display.
2. Adjust the sharpness ring (lower ring) on the lens unit according to the approximate current distance of the object bearing the code until you can see a clear and non-distorted image of the code on the online image display. The reference point for the reading distance is the center of the front window on the screwed-on optics protective hood (see adjacent figure on right). If the hood has been removed, the front edge of the illumination unit can be used instead.
3. If necessary, use the SHUTTER TIMER, BRIGHTNESS, and CONTRAST slider controls to optimize the brightness and contrast.
4. If you have trouble adjusting the sharpness on the lens unit, you may wish to activate the sharpness diagnostics bar on the bottom left of the display window. To do this, click the DISPLAY SHARPNESS check box.

5. Keep adjusting the sharpness setting on the lens unit until the color of the bar indicator changes to green.
6. Once the online image adjustment process has been successfully completed, use the locking screws to lock both adjusting rings of the lens unit in place.
7. Attach the round optics protective hood and screw it tight.

**Continuing the configuration process**

1. Make settings for additional functions during planned operation such as codes, reading trigger, read result formats, data interface, etc.
2. Go to the image display window (ONLINE IMAGE), click the Operation button, and test the settings in read mode (real operation).

**Completing the configuration process**

- Permanently save the entire configuration: Parameter set in Lector®65x Click the Save button Configure file on the PC Click the Save button.

**Important**

To put the Lector®65x into operation on a network (e.g., CAN bus) together with other SICK products, select the "SOPAS" program option. Path: Start > Programs > SICK > SOPAS Engineering Tool > SOPAS.

**Description of the device**

**Device design**

- Lector®65x (camera housing)

**Adjusting the brightness and sharpness on the lens unit**

1. Set the aperture ring on the lens unit to a value of 6, which is an appropriate starting value. To increase the depth of field (value <8) or the image quality (value >8), this value may need to be adjusted in conjunction with the online image display.
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**Device design**

- Lector®65x (camera housing)

**Adjusting the brightness and sharpness on the lens unit**

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2. Adjust the sharpness ring (lower ring) on the lens unit according to the approximate current distance of the object bearing the code until you can see a clear and non-distorted image of the code on the online image display. The reference point for the reading distance is the center of the front window on the screwed-on optics protective hood (see adjacent figure on right). If the hood has been removed, the front edge of the illumination unit can be used instead.
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6. Once the online image adjustment process has been successfully completed, use the locking screws to lock both adjusting rings of the lens unit in place.
7. Attach the round optics protective hood and screw it tight.

**Continuing the configuration process**

1. Make settings for additional functions during planned operation such as codes, reading trigger, read result formats, data interface, etc.
2. Go to the image display window (ONLINE IMAGE), click the Operation button, and test the settings in read mode (real operation).

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- Permanently save the entire configuration: Parameter set in Lector®65x Click the Save button Configure file on the PC Click the Save button.

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To put the Lector®65x into operation on a network (e.g., CAN bus) together with other SICK products, select the "SOPAS" program option. Path: Start > Programs > SICK > SOPAS Engineering Tool > SOPAS.

**Description of the device**

**Device design**

- Lector®65x (camera housing)
the illumination unit for long periods. May be harmful to the eyes.
• Do not look at the laser directly with optical instruments (magnifiers).
• Comply with the latest version of the applicable standards on photobiological safety of lamps and lamp systems as well as on laser protection.
• If the product 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.

Status displays on the second display level

 overlooking this risk can result in serious injury or damage to the surrounding area.

Overview of electrical connections

Overview of pin assignment and design of connections

Test (reading diagnostics)
Percentage Evaluation: The Lector®65x records a series of images and uses the current reading performance settings to decode them. The read rate of the last 10 attempts is displayed in % in the bar graph display.

Teach-in
When you teach in a match code, the Lector®65x 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 SOPKX.

Auto-Setup
The Lector®65x adjusts itself automatically to suit the lighting conditions and the quality of the read code presented. It saves the calculated values permanently in accordance with the default setting.

Micro SD memory card (optional accessory)
Function
With the optional plug-in memory card, the Lector®65x back up the last permanently modified parameter set externally as well as cloning. Furthermore, the Lector®65x can record optional images, e.g., when codes cannot be read (“No Read”) (for details of the parameter backup concept and other memory card functions, see the online help function of the Lector®65x).

A memory card is not included in the scope of delivery. To ensure that the memory card functions reliably, only types approved by SICK (see www.sick.com) should be used.

Inserting the memory card
➢ To avoid damaging the memory card, make sure there is no power to the Lector®65x when you insert or remove it.
On the Lector®65x, the card slot can be accessed on the rear of the device. It is located behind the black cover above the type label (► see  in “Device design”, page 3).
Maintaining the IP 65 enclosure rating: ► see “Safety information”, page 1.
1. To release the cover, use the socket key provided (wrench size 2) to undo both (captive) hexagon socket screws.
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 back on.

NOTE
Risk of data loss or irreparable damage to the memory card!
The Lector®65x does not signal when the card is being accessed (for read or write purposes) (unlike an electronic camera with a memory card).
If parameter values are changed on the Lector®65x using the SOPAS configuration software and the “permanent” option or if functions that started are needed to access the memory card (e.g., image recording), do not remove the memory card or do not switch off the supply voltage.

To remove the memory card safely during operation, select the REMOVE CARD function under ANALYSIS TOOLS/MicroSD CARD in the configuration software SOPAS and wait for SOPAS to provide confirmation.

### Technical specifications (excerpt)

#### Model Name | Lector®65x Flex
--- | ---
**Focus**
Manual adjustment of the sharpness and aperture on the optional lens unit.

#### Illumination for field of view
Optional, e.g., with the integrable VI33 illumination unit: 11 LEDs, visible light. White (l = 6,000 ± 50 K or blue (l = 455 ± 20 nm) (V2D65x MCAx).

#### Feedback LED (spot in field of view)
Optional, e.g., with the integrable VI33 illumination unit: 1 LED, visible light. Green (l = 525 ± 15 nm).

#### LED risk group of the VI33 integrable illumination unit
White/green (variant no. 206506, no. 2074001, no. 2065999) and blue - medium/green (no. 2074012) and blue - wide/green (no. 2074009): Risk group 3 (low risk) acc. to IEC 62471-1: 2006-07/EN 62471-1: 2008-09. Irradiance: I = 10 x 10⁶ W/m² within 100 s or I = 7 x 10⁶ W/m² within 10 s with a distance of ≥ 200 mm.

#### Aiming laser (field of view)
Visible light, red (λ = 630 nm ... 680 nm), with a distance of > 1 m.

#### Laser class

#### Code resolution
≥ 0.1 mm, depending on lens unit.

#### Reading distance
See “Field view diagram”, page 5.

#### Lens unit
Application-specific, see Lector®65x Prod-Part no. (no. 8016253).

#### Image sensor
Monochrome (gray scale value), sensor resolution (V2D65x MCAx) depends on model, see Table 2.

#### Image frame rate
70 Hz at 2 Mpix, 40 Hz at 4 Mpix (V2D65x MCAx).

#### Ambient light safety
2,000 in on code.

#### Bar code types

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2D</td>
<td>Data Matrix ECC200, GS1 Data Matrix MaxCode, PF417, QR Code</td>
</tr>
</tbody>
</table>

#### Image memory
Internal 512 MB, externally on optional micro SD card (max. 16 GB).

---

### Model Name | Lector®65x Flex
--- | ---
**Serial RS-232/422/485**
Host (300 Bd ... 115,2 kBd), for data output.

**Serial RS-232**
Aux (5,76 kBd), for configuration/diagnostics and image transmission.

**USB**
Aux (USB 2.0), for configuration/diagnostics and image transmission.

**Ethernet**
Aux, Host, image transmission (FTP), TCP/IP, Ethernet/IPv. For MAC address(es) see type label.

**CAN**
20 kbit/s to 1 Mbit/s Protocol: SICK CAN sensor network.

**PROFIBUS**
Optional via external fieldbus module CDF600-21xx.

**PROFINET IO**
Optional via external fieldbus module CDF600-2200.

#### Digital switching inputs/outputs

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
</table>
| 2 physical, 2 additional external via optional CDM00 module in connection module CDB650-204 or CDM420-0006. Vᵢₙ = max. 32 V < Vᵢₙax, max. 5 mA, opt-decoupled, reverse polarity protected, adjustable debounce time | Vᵢₙ = max. 15 V < Vᵢₙax, max. 100 mA.

#### Digital switching outputs
4 x physical, 2 x additional external via optional CDM00 module in connection module CDB650-204 or CDM420-0006. Vᵢₙ = max. 15 V < Vᵢₙax, max. 100 mA, short-circuit protected, temperature protected. Not electrically isolated from supply voltage.

#### Electrical connections

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x LED (feedback LED, green)</td>
<td>1 x beeper for signaling events, can be deactivated</td>
<td>Optional, e.g., with the integrable VI83I illumination unit: 1 x LED, visible light. Green (l = 525 ± 15 nm).</td>
<td>1 x LED (feedback LED, green)</td>
</tr>
</tbody>
</table>

#### Electrical protection class
III acc. to EN 60065-1: 2011-01.

#### Enclosure rating
IP 65 to EN 60529: 2000-09 (V2D65x MCAx).

#### EMC

#### Vibration resistance
Shock resistance:
- 5 g, impulse: 4 ms, time: 2 s, Storage - 15°C ... 70°C

#### Environmental conditions

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative humidity</td>
<td>0% ... 90%, non-condensing</td>
</tr>
</tbody>
</table>

#### Maintenance and care

The Lector®65x is maintenance-free. No maintenance is required.  
In order to obtain maximum reading performance from the Lector®65x, 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 Lector®65x in harsh environments (dust, abrasion, temperature, etc.).

---

### Table 1

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Lector®65x Flex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lector®652 Flex 2 Mpx</td>
<td>2 Mpix, 2,048 px x 1,088 px</td>
</tr>
<tr>
<td>Lector®654 Flex 4 Mpx</td>
<td>4 Mpix, 2,048 px x 2,048 px</td>
</tr>
</tbody>
</table>

#### Table 2

<table>
<thead>
<tr>
<th>Field of view in mm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2D654R</td>
</tr>
<tr>
<td>100 x 100</td>
</tr>
<tr>
<td>400 x 400</td>
</tr>
<tr>
<td>600 x 600</td>
</tr>
<tr>
<td>700 x 700</td>
</tr>
<tr>
<td>800 x 800</td>
</tr>
</tbody>
</table>

### Interpreting the diagram

**Example:**

**Given (in red):**
- Code resolution: 0.4 mm
- Focal distance of lens: 35 mm

**Read (in green):**
- Maximum reading distance: 3.680 mm
- Field of view V2D652R: approx. 550 mm x 550 mm
- Field of view V2D654R: approx. 550 mm x 275 mm

---

**Online data sheet:**
moisture, etc.). The reading window must be kept clean and dry for reading.

➢ If the reading window becomes contaminated, clean it carefully with a soft, moist (diluted detergent) cloth.

Important!

➢ If the reading window is scratched or damaged (cracked, broken), the optics protective hood must be replaced immediately using a spare part of identical design (reading window material).

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 (no. 5600000) in combination with the SICK lens cloth (no. 4003353).

Transport and storage

Transport and store the camera housing of the Lector®65x and any optional optic kit in their original packaging, ensuring in the case of the former that the protective caps/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 camera housing in air-tight 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).

Repair

Repair work on the camera housing of the Lector®65x may only be performed by qualified and authorized service personnel from SICK AG. Spare parts may be purchased to enable the replacement of any optic kit parts that have become defective (spacers are only available in pairs).

Disassembly and disposal

⚠️ WARNING

Risk of burns due to hot device surface!

During operation, the surface of the Lector®65x housing (particularly the rear of the device) can reach temperatures of up to 70°C.

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

Any Lector®65x which can no longer be used at the end of the product life cycle must be disposed of in an environmentally-friendly manner in accordance with the country-specific waste disposal regulations that are applicable at the time. It is categorized as electronic waste, the Lector®65x must never be disposed of with household waste! SICK AG is not currently able to take back devices that can no longer be used.

Sources for obtaining additional information

Additional information about the Lector®65x and its optional accessories can be found in electronic form on the following online product pages:

- Image-based code reader Lector®65x (www.mysick.com/en/lector65x)
  - Detailed technical specifications (online data sheet)
  - EC declaration of conformity
  - Dimensional drawing and 3D CAD dimension models in various electronic formats
  - Functional zero diagrams
  - Compatible accessories (including cables, brackets, trigger sensors, external illumination units)
  - Lector®65x Technical Information in German (no. 8016184) and English (no. 8016185)
  - Ordering information in the Lector®65x Product Information in German (no. 8016252) and English (no. 8016253)
  - Publications dealing with accessories

Integrating the Lector®65x FIELDBUS into PROFIBUS DP

- CDF600-21xx PROFIBUS DP Fieldbus Module Operating Instructions in German (no. 8015334) and English (no. 8015335)
- CDF600-21xx PROFIBUS DP Fieldbus Module Technical Information in German (no. 8015336) and English (no. 8015337)
- CDF600-2200 PROFINET IO fieldbus module (www.mysick.com/en/cdf600-2200)
- CDF600-2200 PROFINET IO Fieldbus Module Operating Instructions in German (no. 8015921) and English (no. 8015992) and possibly other languages and other regulations if applicable

Documents on request

- Overview of command strings for Lector®65x
- Instructions in German (no. 8015921) and English (no. 8015922) and possibly other languages and other regulations if applicable

Exclusion of liability

The firmware of the Lector®65x was developed using open-source software. The user is exclusively responsible for any modifications made to open-source components. All warranty claims shall be invalidated in this case.

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List of software licenses and license texts

In the Lector®65x product, SICK uses unmodified open-source software and, insofar as required and where permitted under the relevant license conditions, modified open-source software.

The firmware of the Lector®65x is, therefore, subject to the licenses listed below.

For details of the associated license texts that relate to the license overview provided below, please refer to the Lector®65x Technical Information, License Texts for Open-source Software (no. 8015467). This can be downloaded from the Lector®65x product page on the web:

www.mysick.com/en/lector65x

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