EN

OPERATING INSTRUCTIONS

ICR849-2L FlexLens

Image-based code reader

Intended use

The image-based ICR849-2L FlexLens is an intelligent sensor for automatic decoding of codes on stationary objects. It reads all commonly used 1D codes (bar codes/stacked codes) and 2D codes (matrix codes). Optional accessories like a C-mount lens and an external illumination unit are used to adapt the ICR849-2L FlexLens to the application-specific reading distance and to illuminate the reading area. The ICR849-2L FlexLens sends the reading data to a higher-level computer via its host interface for further processing.

The purpose of these operating instructions is to allow you to take the ICR849-2L FlexLens into operation quickly and easily, and to achieve the first reading results. It describes the commissioning for an application with **one** ICR849-2L FlexLens.
Further information is available in the *online help of the CLV-Setup configuration software* or on the *product page on the web (www.mysick.com/en/icr84x-2_flexlens)*.

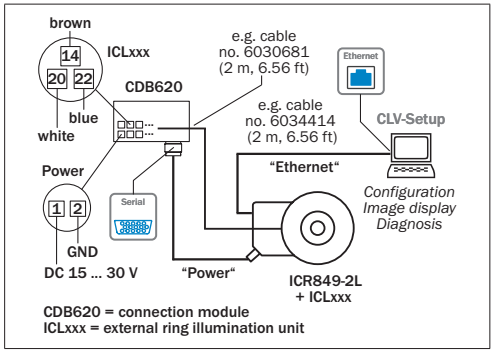
Safety information

- Read this manual before commissioning the ICR849-2L FlexLens in order to familiarize yourself with the device and its functions.
- Connect or disconnect electrical linkages between the ICR849-2L FlexLens and other devices only under de-energized conditions. Otherwise, the devices could suffer damage.
- Conductor cross sections have to be selected, implemented and protected according to valid engineering standards. If the supply voltage for the ICR849-2L FlexLens is not fed via the connection module CDB620/CDM420, the ICR849-2L FlexLens needs to be protected by a separate slow-blow fuse of max. 0.8 A at the beginning of the feeding circuit.
- Only use the ICR849-2L FlexLens under permitted ambient conditions (e.g. temperature) and only in industrial areas (➜ see *"Technical specifications (extract)"*).
- Do not look into the illumination unit of the ICR849-2L FlexLens, in order to avoid potential eye injury due to the bright light.
- Do not open the ICR849-2L FlexLens. If the device is opened, any warranty claims against SICK AG shall be deemed invalid.

Commissioning and configuration

Step 1: Electrical installation

1. Connect the Ethernet interface of the ICR849-2L FlexLens to the PC.
2. Connect the external illumination unit to the ICR849-2L FlexLens e.g. via the connection module CDB620.
3. Supply the ICR849-2L FlexLens with voltage.



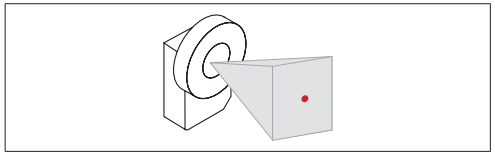
Electrical connection block diagram of the ICR849-2L FlexLens

Step 2: Installation and alignment

1. Mount the ordered accessories (light filter if required, C-mount lens and external illumination unit) to the ICR849-2L FlexLens. If required, also mount the ordered accessory (lens protection hood) to reach protection class IP 65.
2. Mount the ICR849-2L FlexLens on a holder using 2 screws (M5). To do this, use both blind hole threads on the bottom of the housing. Mounting bracket no. 2039465 (accessory) can be used. Turn in the screws max. 8 mm (0.32 in) into the blind hole threads (➜ see *"Device description"*).

Aligning the ICR849-2L FlexLens with the code

➢ Take account of the shape, alignment and dimensions of the field of view in front of the ICR849-2L FlexLens.

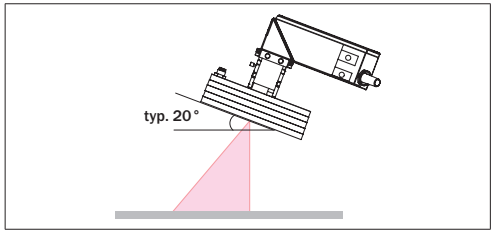


Field of view in front of the device, dimensions depending on distance

Taking account of the reading distance which is dependent on resolution and selected lens type

➜ See *"Reading field diagram"*

Taking account of the reading angle



Selection of the skew angle, depending on the application

➢ Typically, skew the ICR849-2L FlexLens by 20° out of the perpendicular in relation to the surface of the code, in order to avoid disruptive reflections.

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

Step 3: Configuration

a. Configuration with PC

The parameters of the ICR849-2L FlexLens are adapted to the application and the diagnosis is performed using the CLV-Setup configuration software. To provide assistance, the ICR849-2L FlexLens outputs the images it has taken for display in CLV-Setup (at least V5.1) and ImageFTP.
If the reading properties of the ICR849-2L FlexLens have been adapted without a PC, CLV-Setup is used in general for continuing the configuration (reading trigger, read result formats, data interface, etc.).

Installing and starting the configuration software

1. Install the CLV-Setup software from the enclosed "Software & Manuals 1D/2D Code Readers" CD-ROM onto the PC (alternatively, download and install it from the website at *www.sick.com/software*). Select the "Complete" option as suggested by the install wizard.
2. After finishing the installation start CLV-Setup.
   Path: Start > Program Files > SICK > CLV-Setup > CLVMain.

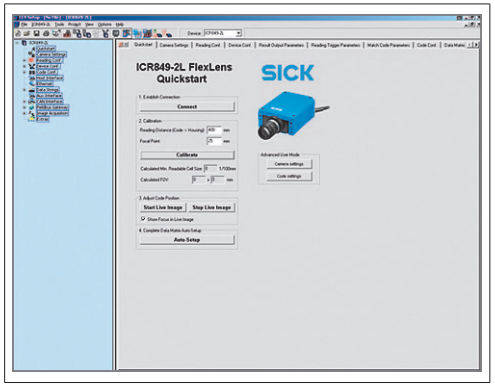
Connecting the device to CLV-Setup

1. Select the ICR849-2L in the DEVICE list on top of the CLV-Setup program window.
2. Establish the communication between the software and ICR849-2L FlexLens via Ethernet.
   To do so, start the connection wizard on the QUICK START tab and follow the steps in the wizard.
   Select the ICR849-2L FlexLens from the available devices.

Calibrating the device and adapting the settings

1. On the QUICK START tab enter the reading distance between housing of the ICR849-2L FlexLens and code.
2. Enter also the focal point of the lens in use.
3. Click the CALIBRATION button.
4. Start live image.
   Adapt focus and aperture manually on the lens until the displayed image is sharp and rich in contrast.
5. Present the code to be read in the defined distance, e.g. the code sample below.
   Use the red aiming laser point for positioning the code in the middle of the field of view.

CLV-Setup program window



Code sample

Configuring reading properties with the wizard

➢ Start AUTO-SETUP.
With the Auto-Setup function, the ICR849-2L FlexLens automatically adapts itself to the light conditions and the quality **of a data matrix code** that is presented. The parameter values calculated for the two modules "camera settings" and "code settings" can be stored temporarily or permanently in the device. CLV-Setup displays the

parameters values in the according parameters on the CAMERA SETTINGS and CODE CONFIGURATION tabs.

Continuing configuration

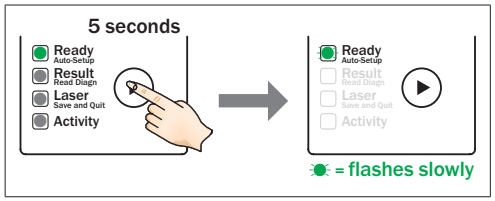
1. To optimize the ICR849-2L FlexLens manually in the image and code settings, click the CAMERA SETTINGS and CODE SETTINGS buttons e.g. on the QUICK START tab and adjust the parameter values.
2. To make the changes visible directly, click the START LIVE IMAGE button on the QUICK START tab.
   The ICR849-2L FlexLens records images and decodes them using the current settings.
   The switching inputs and outputs as well as data output via the host interface are deactivated in LIVE IMAGE mode.
3. Make settings for additional functions such as reading trigger, output formats, data interface, etc.
4. On the QUICK START tab, click the STOP LIVE IMAGE button and test the settings in read mode (real operation).
5. Finally, store the configuration permanently in the ICR849-2L FlexLens using the symbol and on the PC using the symbol.

b. Configuration without PC

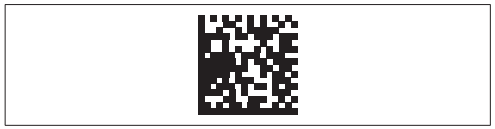
The function button and three LEDs with their second display level are used for adapting the reading properties of the ICR849-2L FlexLens without a PC. For this purpose, the lens must have been adjusted in advance to sharpness and contrast by using CLV-Setup on the PC (➜ see *"a. Configuration with PC"*).

With the Auto-Setup function, the ICR849-2L FlexLens automatically adjusts itself to the light conditions and the quality **of a data matrix code** that is presented. The values calculated for the two modules "camera setting" and "code settings" are permanently stored (default), thereby overwriting the existing configuration.

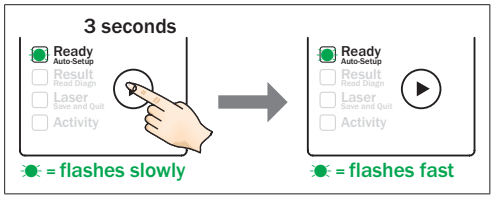
1. Enter "Edit" mode.



2. Align the ICR849-2L FlexLens with the code sample.



3. Start Auto-Setup.



Feedback from the ICR849-2L FlexLens in Auto-Setup

The "Auto-Setup" and "Read Diagn" LEDs signal the success status.

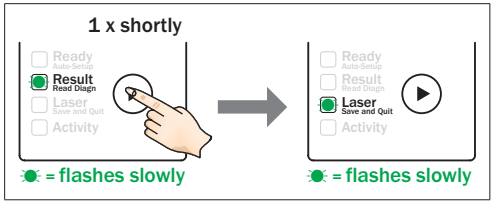
LED	Status
	Auto-Setup LED flashes slowly: Auto-Setup selected
	Auto-Setup LED flashes fast: Auto-Setup started
	Read Diagn LED flashes slowly: Auto-Setup successfully finished
	Auto-Setup LED: Auto-Setup was unsuccessful

● = lit; ☀ = flashing

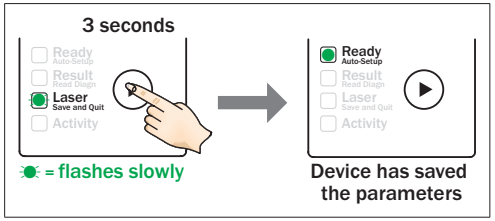
Important

- ➢ If the read result is inadequate ("Auto-Setup" LED flashes slowly red), check the alignment and the distance of the ICR849-2L FlexLens in relation to the code (➜ see *"Step 2: Installation and alignment"*). Restart Auto-Setup.
- ➢ If necessary, check the adjustment of your lens by analyzing the resulted image using ImageFTP (Live image), ➜ see *"a. Configuration with PC"*)

4. Prepare saving the configuration.

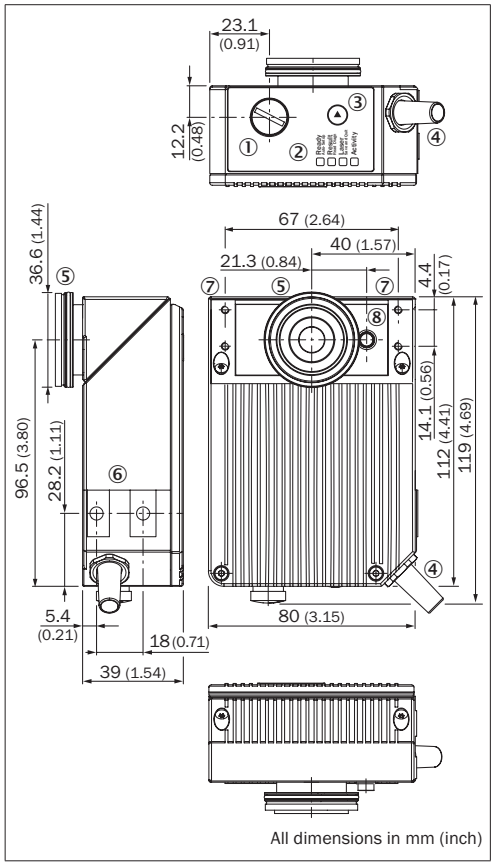


5. Exit "Edit" mode.



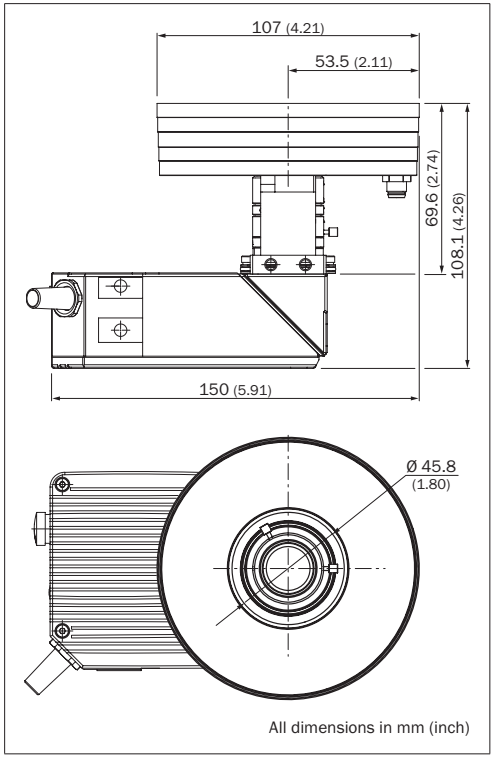
Device description

Device structure



① 4-pin M12 socket, D-coded, behind cap ("Ethernet" connection)
② LED for status display (2 levels), 4 x
③ Function button
④ Connection cable 0.9 m (2.95 ft) with 15-pin D-Sub HD plug ("Power/Serial Data/CAN/I/O" connection).
Minimal cable bend radius: 20 mm (0.8 in)
⑤ C-mount lens and IP 65 protection hood adapter (threads)
⑥ Blind hole thread M5, 8 mm (0.32 in) deep (2 x), for mounting the ICR849-2L FlexLens to a holder
⑦ Blind hole thread M3, 4.5 mm (0.18 in) deep (4 x), for mounting the two brackets of external ring illumination units ICLxxx
⑧ Aperture for laser beam of the aiming laser (laser pointer)

Ring illumination unit (accessory)



⚠ CAUTION

Laser radiation of the aiming laser (laser pointer)

The aiming laser operates with a laser of class 1.
Regarding the intended use, under normal and sensible conditions the accessible radiation from the laser module is not hazardous to the human eye and skin. Blinding, impairment of ability to see colors, or other temporary irritations, however can not be excluded, particularly with regard to low ambient light intensity. No safety precautions are required.

Caution – use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

- ➢ Do not deliberately look directly into the aiming laser for a lengthy period.
- ➢ Do not open the housing of the ICR849-2L FlexLens.
- ➢ Always apply the latest valid version of laser protection regulations.

For further information, ➜ see *"Technical specifications (extract)"*.

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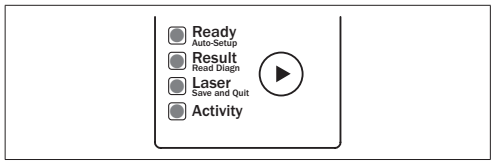
Status displays, functions



Status displays on the first display level

Display	LED	Status
Ready	●	Device ready for reading
	●	Hardware fault
Result	●	Successful reading
Laser	●	Laser/external illumination on (in reading mode)
Activity	✳	Data traffic via Ethernet interface

● = lit; ✳ = flashing

Status displays on the second display level

Display	LED	Status
Auto-Setup	✳	Auto-Setup LED flashes slowly: Auto-Setup selected
	✳	Auto-Setup LED flashes fast: Auto-Setup started
	✳	Read Diagn LED flashes slowly after Auto-Setup: Auto-Setup successfully finished
	✳	Auto-Setup was unsuccessful (flashes slowly)
Read Diagn	✳	Read diagnosis selected (flashes slowly)
	✳	Read diagnosis started (flashes fast)
Save and Quit	✳	Save and Quit selected (flashes slowly)
Cancel	✳	Auto-Setup LED, Read Diagn LED, Save and Quit LED flashes slowly

● = lit; ✳ = flashing

Auto-Setup

The ICR849-2L FlexLens automatically adjusts itself to the light conditions and the quality of a **data matrix code** that is presented. The calculated values can manually be permanently saved.

Read Diagn

The ICR849-2L FlexLens records images and decodes them using the current settings for the reading properties. Each successful decoding is indicated by a beep.

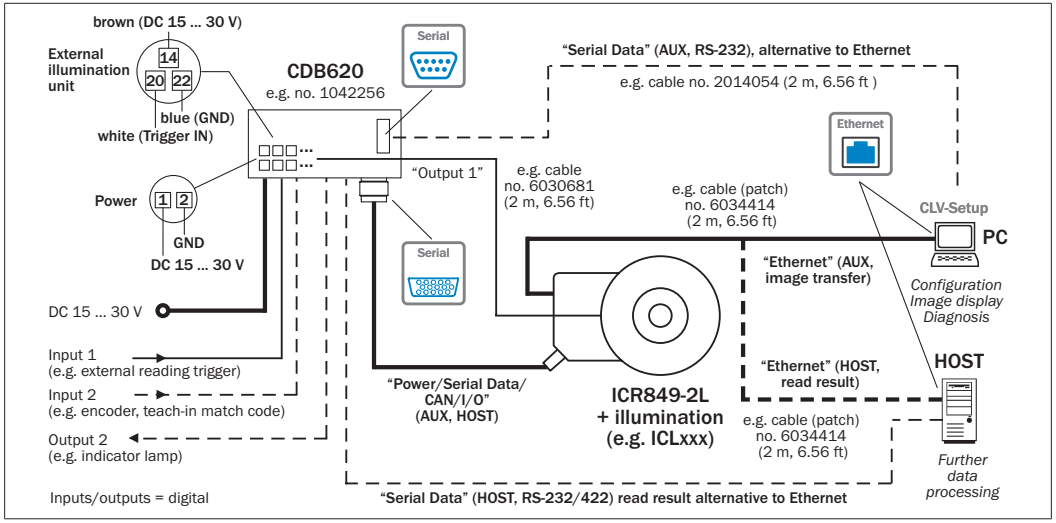
Save and Quit

The ICR849-2L FlexLens saves the determined values temporarily or permanently (default) depending on the selected Auto-Setup mode.

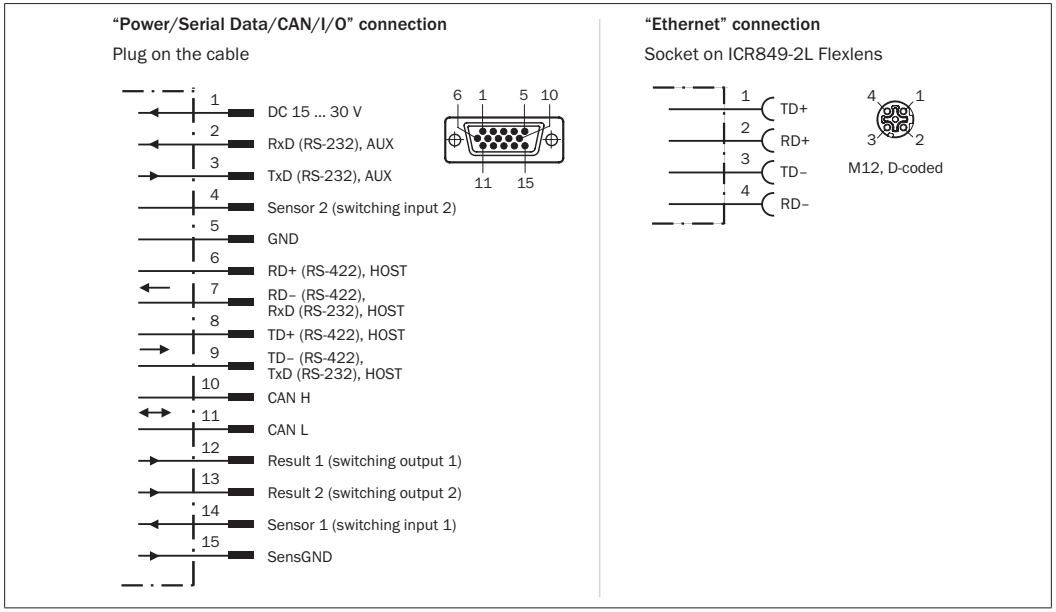
Cancel

All three LEDs flash slowly. Press the button for 5 seconds to abort the "Edit" mode. The ICR849-2L FlexLens returns to the reading mode without any changing of settings.

Overview of all interfaces and connection options



Overview of pin assignment



Technical specifications (extract)

Type	ICR849-2L FlexLens
Focus	Variable focus due to adjustable C-mount lens (accessory)
Illumination of the field of view	Depending on selected illumination unit, see reading field diagram
Aiming laser (in the field of view)	Visible light, red (λ = 630 ... 680 nm), can be switched off
Laser class	Class 1 acc. to IEC 60825-1: 2007-03. Corresponds to 21 CFR 1040.10 with the exception of the deviations acc. to Laser Notice No. 50 dated 24 June 2007. P < 0.39 mW
Image sensor	2,048 x 1,944 pixels, grey values
Image frame rate	10 Hz (for full resolution)
Host interface	RS-232/RS-422 or Ethernet port serial: 300 bd ... 57.6 kbd
Aux interface	RS-232 or Ethernet port serial: 9.6 kbd
Ethernet interface	10/100 Mbit/s, TCP/IP, FTP
CAN interface	10 kbit/s ... 1 Mbit/s
Switching inputs	2 x IN (V_{IN} = max. 28 V, I_{IN} = max. 18 mA)
Switching outputs	2 x OUT (I_{OUT} ≤ 100 mA) Result 1: low-side switch Result 2: high-side switch
Supply voltage	DC 15 ... 30 V*), SELV/PELV acc. to IEC 6034-4-41: 2005
Power consumption	Typ. 8 W (with switching outputs without load) Max. 13.1 W e.g. with illumination unit ICL300
Housing/weight	Zinc die-casting/approx. 900 g (1.98 lb.) with cable 0.9 m (2.95 ft)
Electrical safety	Acc. to EN 61010-1: 2001-03
Protection class	III, acc. to EN 61140: 2002-03
Enclosure rating	IP 65 (EN 60529: 1991-10/A2: 2002-02), with connected cables and mounted lens protection hood
EMC	Electromagnetic interference (RF) EN 61000-6-4: 2007-01 Electromagnetic immunity EN 61000-6-2: 2005-08
Rigidity	Acc. to EN 60068-2-6: 2008-02
Shock resistance	Acc. to EN 60068-2-27: 2009-05
Ambient temperature	Operation: 0 to +40 °C (+32 to +104 °F), storage: –20 to +70 °C (–4 to +158 °F)

*) DC 18 ... 30 V for devices with cables lengths 1 m ... 10 m (3.28 ft ... 32.81 ft)

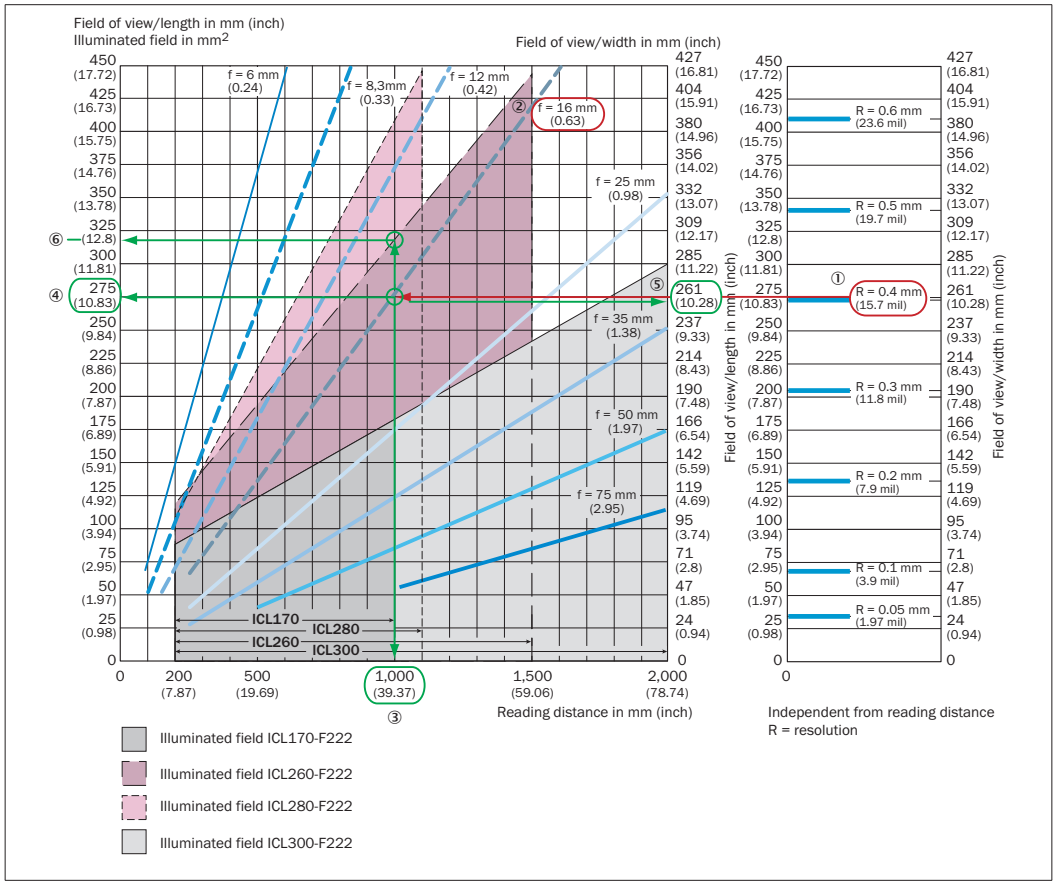
For more technical specifications, see *online data sheet* on the product web page (*www.mysick.com/en/icr84x-2_flexlens*).

NOTE

RF interferences in case of use in residential areas

The ICR849-2L FlexLens is exclusively intended for use in industrial areas (EN 61000-6-4).

Reading field diagram



Interpretation of the diagram:

Using the diagram you can determine:

1. For a selected lens (focal length)

- Maximum of reading distance for a given code resolution
- Field of view for a selected reading distance

2. For a required field of view, reading distance or code resolution

- Suitable lens
- Suitable illumination unit

Sample:

Defined (displayed in **red**):
Code resolution ①: 0.4 mm
Lens (focal length) ②: 16 mm

Determined (displayed in **green**):
Maximum of reading distance ③ : 1,000 mm
Field of view length ④ : 275 mm
Field of view width ⑤ : 261 mm
Illumination field ⑥ : 320 mm x 320 mm

Maintenance and care

The ICR849-2L FlexLens does not contain any components that require maintenance. Also no maintenance is required in order to ensure compliance with laser class 1.

➢ Clean the lens (coated glass) if it is dirty, in order to achieve the full reading rate.
Do this carefully using a soft, damp cloth (with a mild cleaning agent).

Sources for obtaining additional information

Additional information about the ICR849-2L FlexLens and its optional accessories can be found as follows:

"Software & Manuals 1D/2D Code Readers" CD-ROM (part no. 2029112)

- These operating instructions
- CLV-Setup configuration software with online help
- Ordering information in the catalog
- Publications dealing with the accessories

Product web page of the ICR849-2L FlexLens (www.mysick.com/en/icr84x-2_flexlens)

- Detailed technical specifications (online data sheet)
- Dimensional drawing and 3D CAD dimension models in various electronic formats
- EC Declaration of Conformity
- CLV-Setup configuration software with online help
- Reading field diagram
- Overview of all accessories
- All publications contained on the aforementioned CD-ROM (via links)

Support is also available from your sales partner:
www.sick.com/worldwide

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