



# VISION SENSOR CS-60

LICENSING MODEL  
QUICK START GUIDE

# OUR FLEXIBLE ONE. THE CS-60 VISION SENSOR.

## ALSO FOR MORE DEMANDING APPLICATIONS.

The CS-60 Vision Sensor impresses with its powerful, upgradeable software, clever and robust illumination concept, its M12 interchangeable lens system, and extensive optics accessories. Thanks to high-performance image processing tools and the quickly configurable nVision-i software, optimal performance and smooth startup is guaranteed.

### Comprehensive focal lengths through M12 interchangeable lenses

for satisfying all common application requirements in the industrial vision sensor area

### High-performance image-processing tools and a user-friendly, intuitive software interface

ensure simple and seamless integration



### Integrated high power LED illumination in red and white

Illumination can be switched in the software for optimal startup at high speed and at a large working distance

### Upgrade function

The modules “Measurement” and “1D and 2D code Reading” can be acquired separately or together as a software expansion to the standard module (Localization, Detection, Counting) with a simple license model.

### Reliable and fast: The ID Read tools for all common 1D and 2D code types

(Optional upgrade)



### Supports industry protocols

Digital I/O, TCP/IP, Profinet, HTTP, FTP/SFTP and ReST-API are supported

### Robust, compact casing with protection class IP67

For use in working environments with active washing without the application of additional protective equipment

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# LICENSE MODELS FOR CS-60

## I License for nVision-i Parameterization software

- Article 213438  
CS60-DEMO LICENSE
- Creation of offline jobs
- Parameterization of sensor
- Reference to Online Shop,  
Customer Service
- Free

\* With each sensor supplied, the licence key for the nVision-i parameterisation software is included on the delivery note.

## II Upgrade License Function Extension

- Article 213364  
CS60.UP-ID LICENSE
- Article 213365  
CS60UP-MEAS LICENSE
- The licenses are used to  
release functions  
on the sensor.
- Fee-based

## III CD-60 Variants Licensed off the shelf

- Article 212910  
CS60-BM28-EP15/300
- Article 213359  
CS60-BM28-EP15/300ID
- Article 213358  
CS60-BM28-EP15/400
- Article 213360  
CS60-BM28-EP15/400ID
- Article 212911  
CS60-BM38-EP15/300
- Article 213361  
CS60-BM38-EP15/400
- Article 213362  
CS60-BM38-EP15/300ID
- Article 213363  
CS60-BM38-EP15/400ID

# PROCESSES FOR LICENSE MODELS

## I License for nVision-i Parameterization software

- The nVision-i software can be downloaded via the Online Shop or is included in the scope of delivery when purchasing a CS-60 in the form of a USB stick.
- After installation, the window requesting the license is shown.
- To receive the license, di-soric Customer Service must be contacted. The license is subsequently sent by email.

## II Upgrade License Function Extension

- A CS-60 is already present.
- To complete a new task, an expanded functional scope is required.
- The upgrade can be acquired via the Online Shop or via di-soric Customer Service. The sensor serial number is required for this.

## III CD-60 Variants Licensed off the shelf

- The CS-60 is acquired via the Online Shop or Customer Service.
- Off the shelf, the sensor has the license setup uploaded to it and has the ordered status upon delivery.



Parameterization with nVision-i



# FIRST STEPS

## Unboxing



With each sensor supplied, the licence key for the nVision-i parameterisation software is included on the delivery note.

1. Unpack the CS-60, mechanically assemble it and complete electrical wiring according to instructions.
2. Connect the M12 plug end (8-pin) of the Ethernet connection cable to the M12-X socket labeled “LAN” on the sensor.
3. Connect the RJ45 end of the Ethernet connection cable to the RJ45 interface of the Client PC (PC is only required for setup) or the PLC.
4. Connect the sensor to the power supply. To do this, PWR, GND, Trigger and I/O must be properly connected. The power supply must be between 18 and 30 V DC. Caution: It must be ensured that both ends of the cable are firmly and correctly attached to establish a physical connection.
5. Connect the M12 plug (12-pin) of the IO-PWR cable to the free M12 socket (12-pin) of the sensor.

### Note:

- Each CS-60 is delivered with a standard, fixed IP address IP: 192.168.3.15 / subnet mask: 255.255.255.0 and the device name “CS-60.” To avoid network interference, it must be ensured in advance that each IP address is unique within the network!
- The sensor and PC must be in the same IP address range for them to be able to be connected.
- Preferably, use static IP addresses in the network in order to ensure a stable connection.
- If several CS-60 Vision Sensors are to be used simultaneously, the IP addresses must be adjusted in order to prevent network conflicts.

## Installing the nVision-i software:

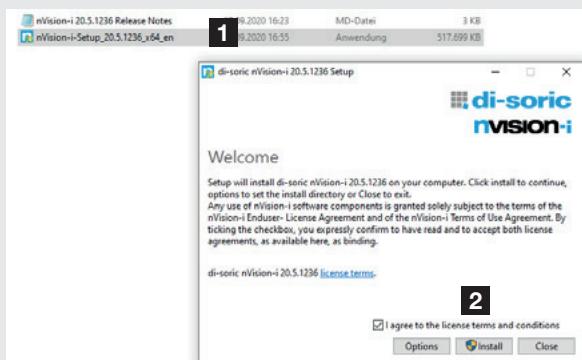
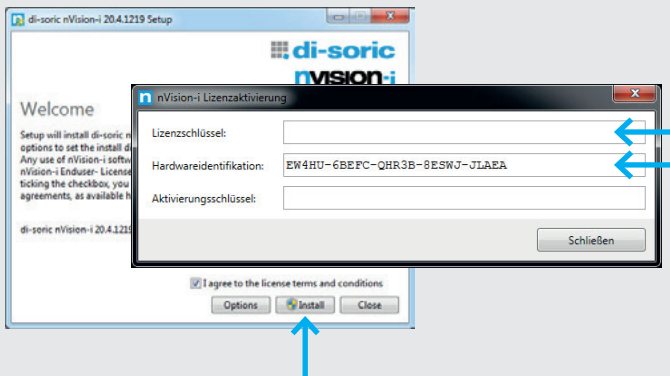


Fig. 01

- The most current software version is available for download on the di-soric homepage at <https://www.di-soric.com/213438>. To ensure that the nVision-i software is installed properly, full administrative rights are required!
- Start installation by clicking on “Install.” Perform the installation steps on the screen according to the instructions on the screen. At the end of a successful installation, a confirmation notice is displayed. The computer may have to be restarted.

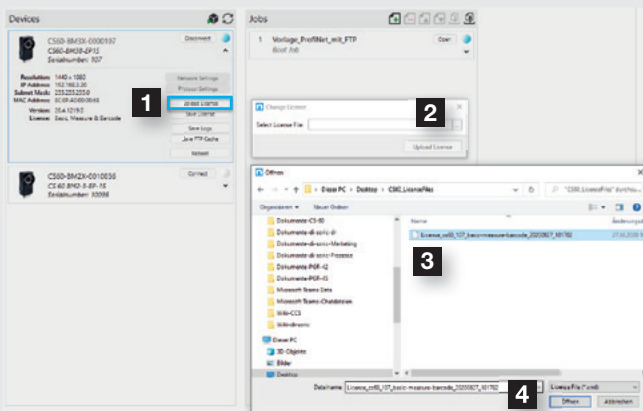
## Licensing



After installation, the nVision-i software asks you to enter the license key. This is available free of charge via di-soric Customer Service.

If the computer being used does not have an Internet connection, Customer Service must also be informed of the hardware identification. Using this information, an activation key is then generated with which the software can subsequently be released.

## Upgrade



1 Start nVision-i and open up the Parameter menu of the sensor.

2 Open file explorer by way of the "Upload license" entry.

3 Select the license file in the file explorer.

4 Upload the file with "Open."

## FAQs

**Even with a functioning Internet connection, retrieval of the license file is not possible.**

**Cause:** All app access to the Internet is blocked by Customer IT as a rule.

**Solution:** Simply perform the installation as described above without Internet access.

**After the installation, the connected sensors are not recognized.**

**Cause:** The app is blocked in the firewall structure of the Customer IT.

**Solution:** Customer IT must release the app.

## Adjusting the settings of the CS-60

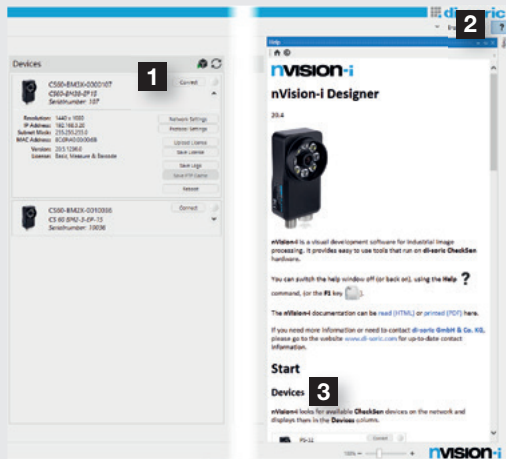


Fig. 02

After starting the nVision-i software, the following image appears: (Fig. 02)

- 1 Connect to Sensor
- 2 Help for selected action
- 3 Help with connection to sensor

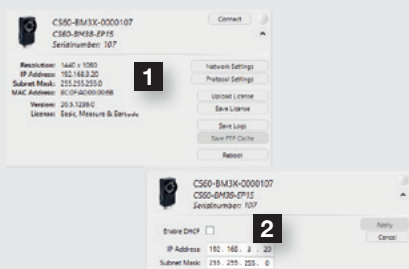


Fig. 03

**Note:**

In this window, adjustments to network settings, such as the assignment of the IP address or the activation of the industry protocols, can be performed. Click on “Apply” to save all changes. (Fig. 03)

- 1 Select Change IP
- 2 Set IP address to network

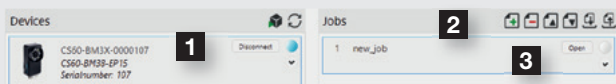


Fig. 04

In the Devices area, a sensor or the emulator can be selected to establish a connection. A new job can then be created using “+” in the Jobs area. By clicking on “Open,” verifications can be set up in the main menu. (Fig. 04)

- 1 Establish connection to sensor
- 2 Create new job
- 3 Open job

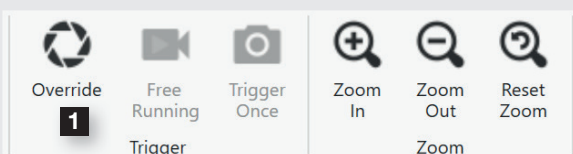


Fig. 05

First select “Override” to put the sensor in editing mode. Click “Trigger Once” to record the first image. Next, you can begin with the image setup and focusing of the lens. (Fig. 05)

- 1 Adopt sensor control

## Focusing the lens

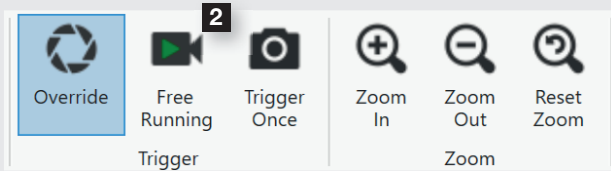


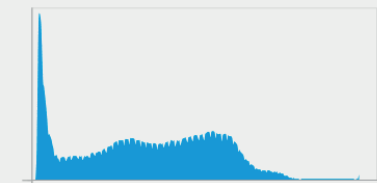
Fig. 06

To do this, continuous recording must be started via “Free Running.” (Fig. 06)

**2** Select Image Trigger

### Acquisition

#### Parameters



Exposure Time

#### Flash Control

Internal  On  Off

Color  White  Red

External

#### Trigger

Type

Polarity  Rising Edge

Falling Edge

Delay

Fig. 07

By turning the lens, the image can then be focused. If needed, the exposure time, the flash mode (flash, color) and the trigger settings can also be chosen in the Acquisition area. (Fig. 07)







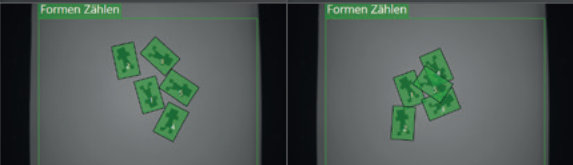

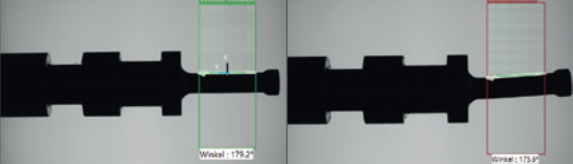

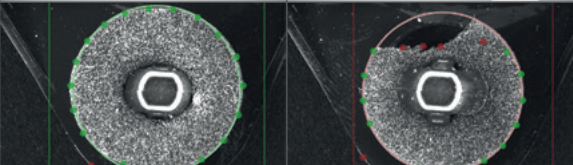



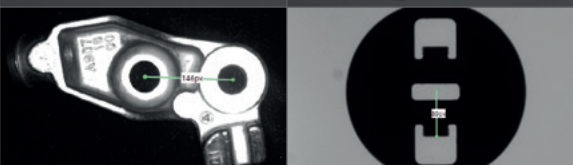



Fig. 08

After a new job has been created, the appropriate verification tool for the task can be selected in the Menu area. To do this, click on the corresponding tool to add it in the Tool list area. It is also possible to add several tools to a job. (Fig. 08)

All configured jobs are saved locally on the CS-60. The Vision Sensor thus works with or changes between jobs which are stored in its memory. But it is also possible to export these jobs to the computer or vice versa.

# THE IMAGE PROCESSING TOOLS


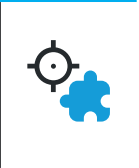




## SIMPLE AND FAST

COUNTING of areas, edges and shapes		✓
<b>AREAS</b>	Determines the number of contiguous dark or bright regions	 
<b>EDGES</b>	Determines the number of edges along a line/search beam	 
<b>SHAPES</b>	Identifies and counts objects whose contour matches the learned contour	 
MEASUREMENT of angles, diameters, distances		+
<b>ANGLE</b>	Determines the angle of an edge	 
<b>CIRCLE</b>	Determines the diameter and circularity	 
<b>DISTANCE</b>	The slider determines the distance between 2 edges	 
<b>POINT-TO-POINT</b>	Measures the distance between 2 contour patterns, 2 circles or mixed points	 
<b>POINT-TO-LINE</b>	Measures the distance between a point (from blob, contour pattern, circle or edge) and a line/edge	 

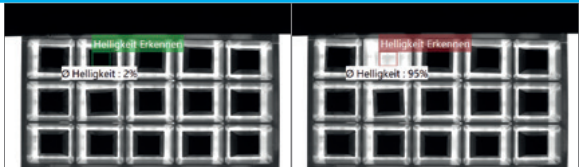



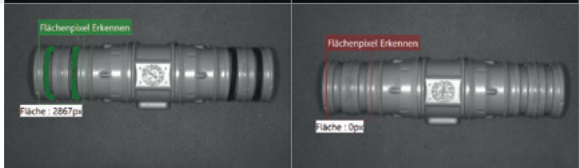
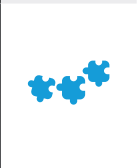
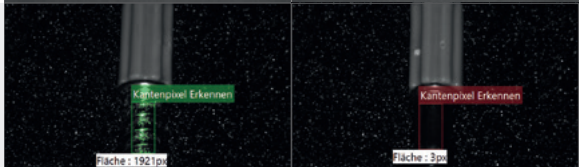

✓ Available    + Available after upgrade





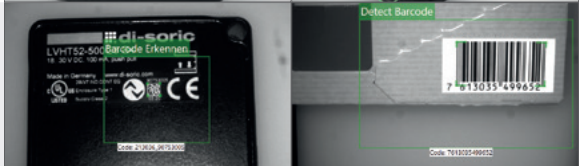



**LOCALIZATION of areas, edges and shapes** ✓

<p><b>AREA</b></p>	<p>The tool “Localize area” is used in order to localize a part in a scene using Blob analysis</p>		
<p><b>EDGE</b></p>	<p>Finds an edge within the defined search field and serves as a guide for subsequent tools</p>		
<p><b>SHAPE</b></p>	<p>Compares learned patterns within the defined working area and also serves as position correction for subsequent tools</p>		

**DETECTION OF THE presence/absence of a feature based on pixel values and contrast** ✓

<p><b>BRIGHTNESS</b></p>	<p>Detects the average brightness as a function of the threshold range within a defined area in the image</p>		
<p><b>CONTRAST</b></p>	<p>Detects the contrast as a function of the threshold range within a defined area in the image</p>		
<p><b>AREA PIXELS</b></p>	<p>Detects the number of pixels as a function of the threshold range within a defined area in the image</p>		
<p><b>EDGE PIXELS</b></p>	<p>Detects the number of edge pixels as a function of the threshold range within a defined area in the image</p>		

**LOCALIZE AND READ 1D and 2D codes** +

<p><b>LOCALIZATION</b></p>	<p>Finds a code within the defined search field and serves as a guide for subsequent tools. Efficient for label fit check</p>		
<p><b>READ</b></p>	<p>Decodes all codes and can evaluate the content using different criteria (regular expressions)</p>		
<p><b>COUNTING</b></p>	<p>Enables multiple recognition of different codes</p>		

# USER INTERFACE

## Structure of the user interface

The CS-60 user interface is made up of 4 areas. The navigation bar in the upper area is for instructions and setup. The verification tools contained here are divided into 4 groups. Double-click on one of these tools to insert it in the area on the left, the so-called Pipeline. Configuration and parameterization of the selected tools can be performed in the area in the middle. Finally, on the right side there is an even larger field in which the image and the drawing tools are displayed.

### A Navigation bar & verification tools:

- Intuitive and user-friendly navigation menu.
- Contextual help can be displayed as needed.
- Menu guidance available in 4 languages.

### B Pipeline & status checks:

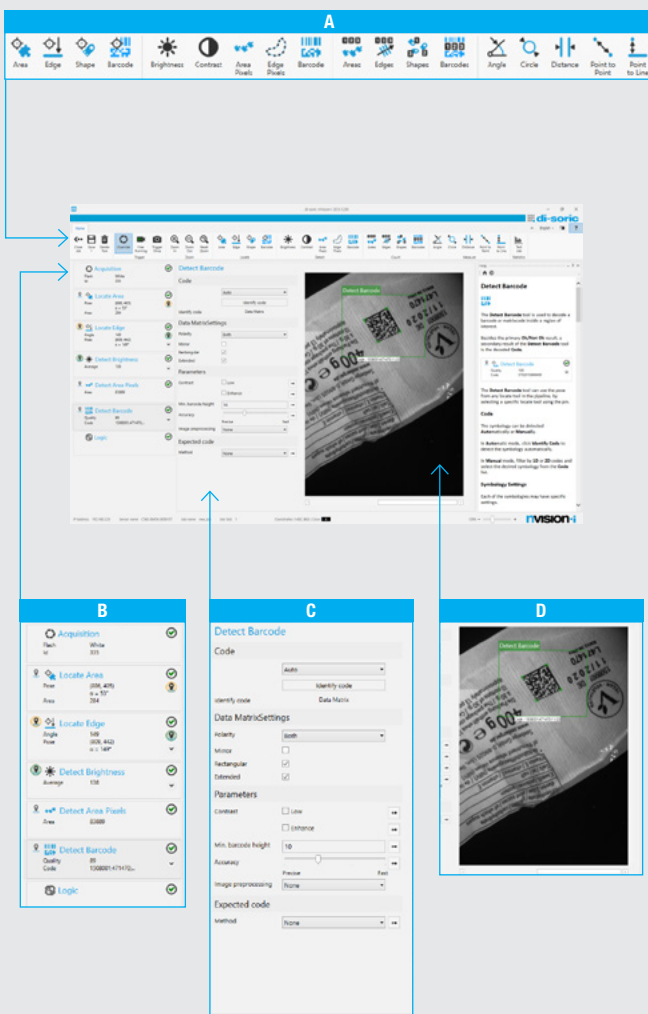
- Verification tools can be inserted here via drag & drop. Measured values and test results/status are shown here.

### C Configuration:

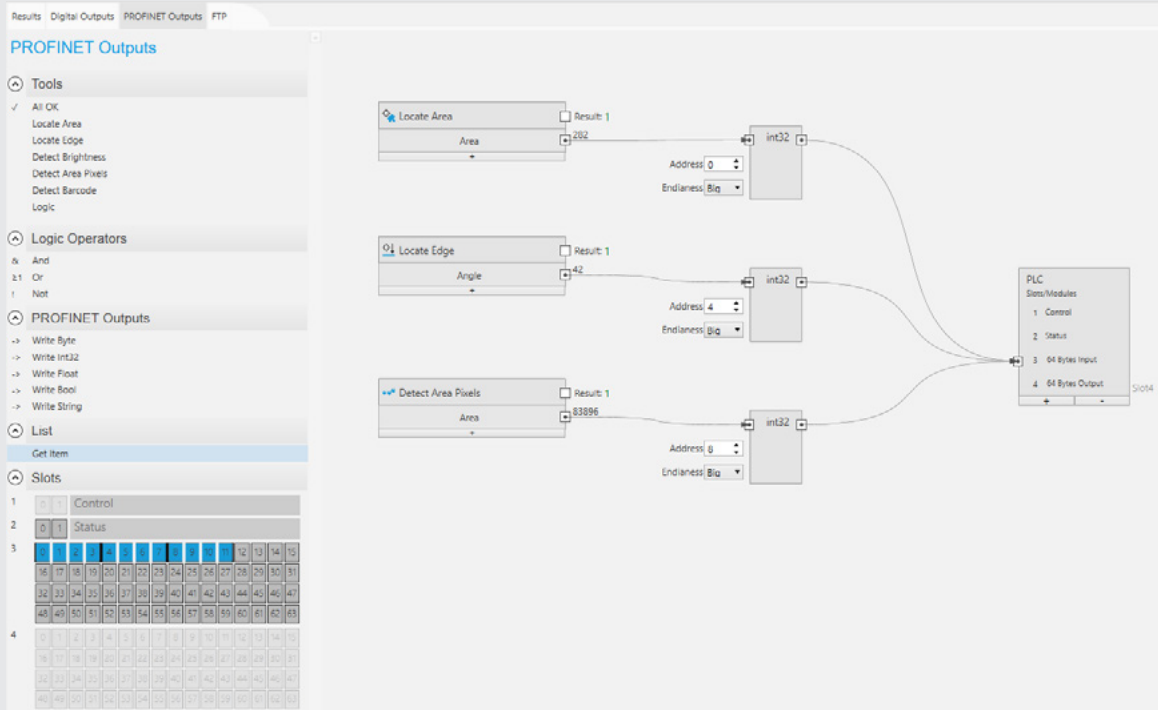
- Parameters for search criteria can be adjusted simply and directly.
- Limit values for the evaluation criteria can be entered easily.

### D Display & Drawing tools:

- Image viewing for checking and analysis during operation.

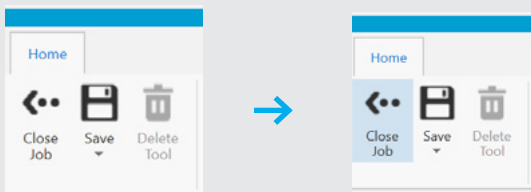


## Communication with higher-level control systems



At the end of editing, the results can be summarized and transmitted to the higher-level control system using the options in the Logic area.

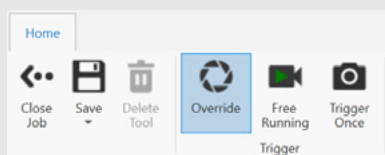
## Saving the job



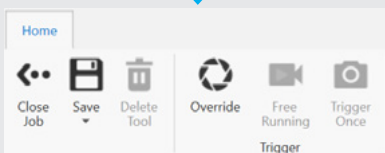
Save the job in the flash memory of the sensor by clicking “Save job.” Return to the starting view with “Close job.”

## Executing the job

Editing state



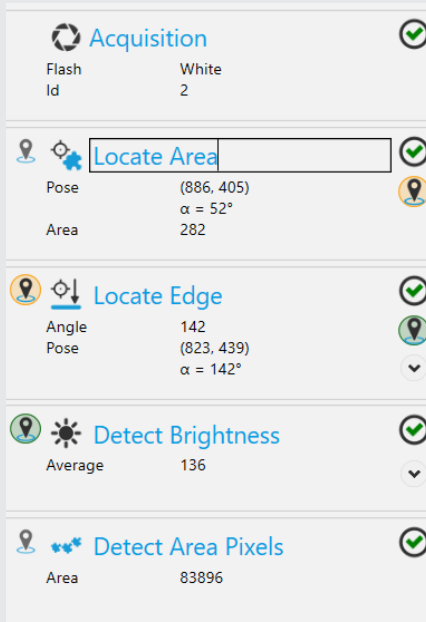
Online state



Select “Override” to execute a job. Now the sensor is active and ready to communicate with the higher-level control.

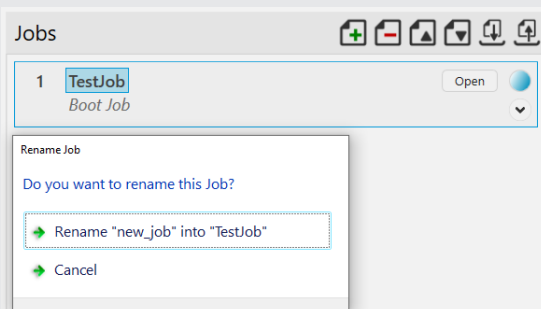
# APPENDICES

## Renaming verification tools



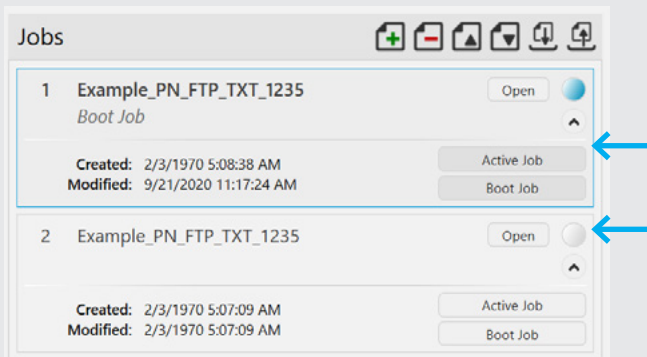
Click on the name field to select and rename it.

## Renaming a job name



To do this, click on the corresponding name field and rename it.

## Setting a boot job

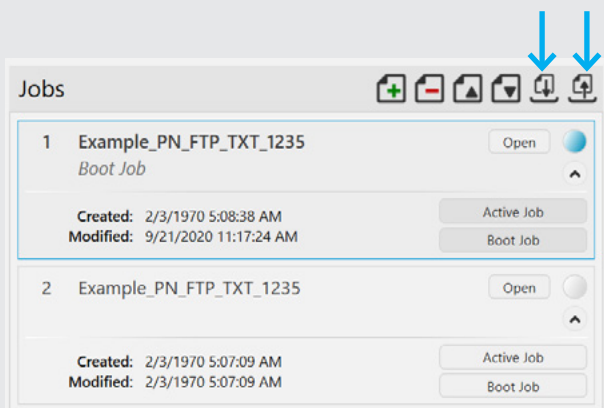


Jobs

1	Example_PN_FTP_TXT_1235 <i>Boot Job</i>	Open	<input checked="" type="radio"/>
	Created: 2/3/1970 5:08:38 AM Modified: 9/21/2020 11:17:24 AM	Active Job	Boot Job
2	Example_PN_FTP_TXT_1235	Open	<input type="radio"/>
	Created: 2/3/1970 5:07:09 AM Modified: 2/3/1970 5:07:09 AM	Active Job	Boot Job

First click on the arrow and then on “Boot job.”

## Importing and exporting the job



Jobs

1	Example_PN_FTP_TXT_1235 <i>Boot Job</i>	Open	<input checked="" type="radio"/>
	Created: 2/3/1970 5:08:38 AM Modified: 9/21/2020 11:17:24 AM	Active Job	Boot Job
2	Example_PN_FTP_TXT_1235	Open	<input type="radio"/>
	Created: 2/3/1970 5:07:09 AM Modified: 2/3/1970 5:07:09 AM	Active Job	Boot Job

Click on the corresponding arrow.

# CS-60 VISION SENSOR

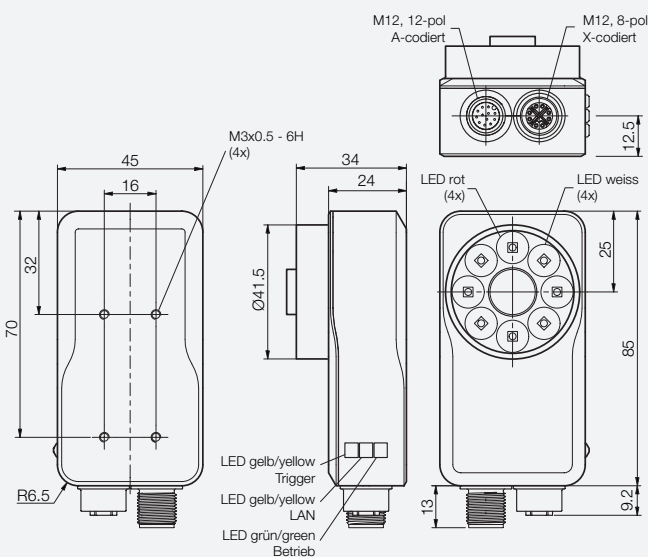
## TECHNICAL DATA





- Compact and high-performance
- High power LED illumination in red and white
- Flexible and high-performance software
- Parameter changes during production
- Easy & intuitive
- Flexible working distances of 50 - 1,500 mm by changing lenses.
- Upgrade option: Measure & read 1D and 2D codes.
- Customization option



### Design / connection information



12-pol A-codiert		
	1 SPS_IN0	7 +UB
	2 SPS_IN1	8 GND
	3 SPS_OUT_2	9 NC
	4 SPS_OUT_3	10 Trigger IN
	5 RESET / READY	11 SPS_OUT_0
	6 COMMON INTERFACE	12 SPS_OUT_1

8-pol X-codiert		
	1 LAN A+	5 LAN D+
	2 LAN A-	6 LAN D-
	3 LAN B+	7 LAN C-
	4 LAN B-	8 LAN C+

### Software requirements

The nVision-i software can be run on the following operating systems:

- -Microsoft Windows 7 (64-bit), SP1
- -Microsoft Windows 10 (64-bit)

Minimum computer requirements:

- Intel® Core™ i3 Processor @1.6GHz
- 2GB RAM (Windows 7 SP1 / Windows 7 Embedded Standard SP1)
- 3GB hard drive space
- 32-bit color display, 1366x768 or 1280x960
- 4.0 Windows Experience Index (particularly for graphics)
- 1 USB 2.0 port and 1 network port

Recommended computer requirements:

- Intel® Core™ i7 Processor @ 2.0GHz
- Internet Explorer 11 / Google Chrome
- 8GB RAM (Windows 7 SP1)
- 10GB of hard drive space
- 32-bit color display, 1920x1080
- 5.0 or greater Windows Experience Index
- 1 USB 2.0 port and 1 Gigabit Network port (Intel Chipset recommended)



<b>CS60-</b> BM28-EP15/300	<b>CS60-</b> BM28-EP15/300ID	<b>CS60-</b> BM28-EP15/400	<b>CS60-</b> BM28-EP15/400ID	<b>CS60-</b> BM38-EP15/300	<b>CS60-</b> BM38-EP15/300ID	<b>CS60-</b> BM38-EP15/400	<b>CS60-</b> BM38-EP15/400ID
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**Standard Tools**

■ Localization	■	■	■	■	■	■	■
■ Part recognition	■	■	■	■	■	■	■
■ Counting	■	■	■	■	■	■	■
■ Measuring			■	■		■	■
■ Read code		■		■		■	■

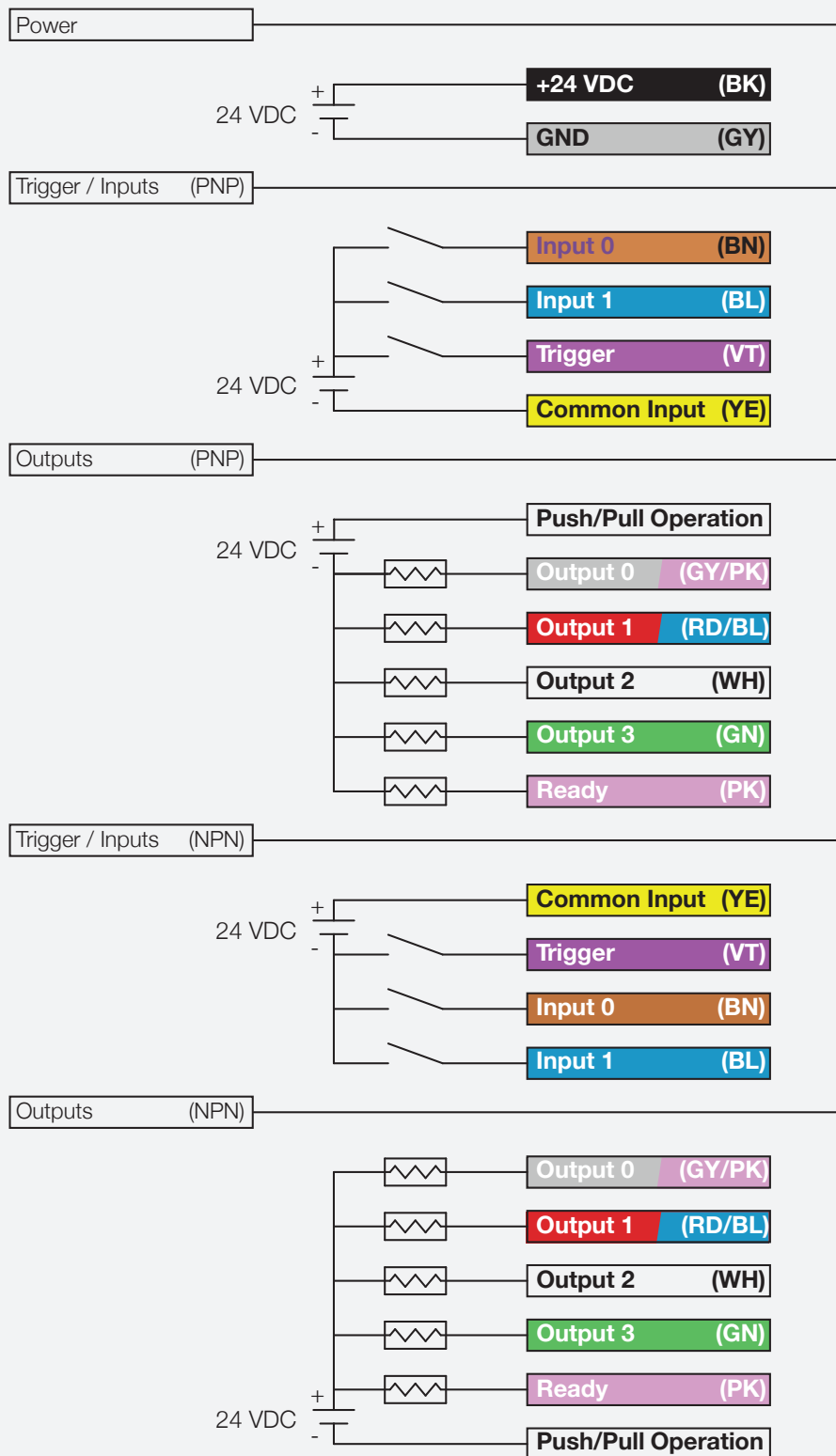
**Upgrade options:**

■ Measurement module	■	■			■	■	
■ Reading 1D& 2D Codes module	■		■		■		■
■ Customization module	■	■	■	■	■	■	■

<b>CMOS type</b>	EV76C541	IMX 273
<b>Optical format</b>	1/4"	1/2.9"
<b>Resolution</b>	736 (H) x 480(V)	1440 (H) x 1080(V)
<b>Pixel size (µm)</b>	4.5 x 4.5	3.45 x 3.45
<b>Shutter</b>	global	global
<b>Max. image frequency (fps)</b>	30	30

<b>Scope of delivery</b>	CS-60 Vision Sensor, lens O-S1-S-080-40, lens cover CS60-Window
<b>Housing dimensions H / W / D</b>	85 / 45 / 34 mm
<b>Service voltage</b>	18 to 30VDC
<b>Working distance</b>	1 Vision Sensor with S-mount - 4 lenses: 50 – 1500 mm
<b>Focal length</b>	Variable - S-mount: 3.6, 8, 16, 25 mm
<b>Internal lighting</b>	Switchable integrated illumination: High Power red, High Power white
<b>Storage / number of jobs</b>	16 GB / to 255
<b>Focusing</b>	Variable focus with aperture 4 and 8
<b>Interfaces &amp; protocols</b>	Digital I/O, TCP/IP, Profinet
<b>Digital inputs / outputs</b>	2 + 1 external trigger / 4 + 1 ready signal
<b>Image storage</b>	Via FTP / manually in the software
<b>Protection class</b>	IP67

## DIO connection

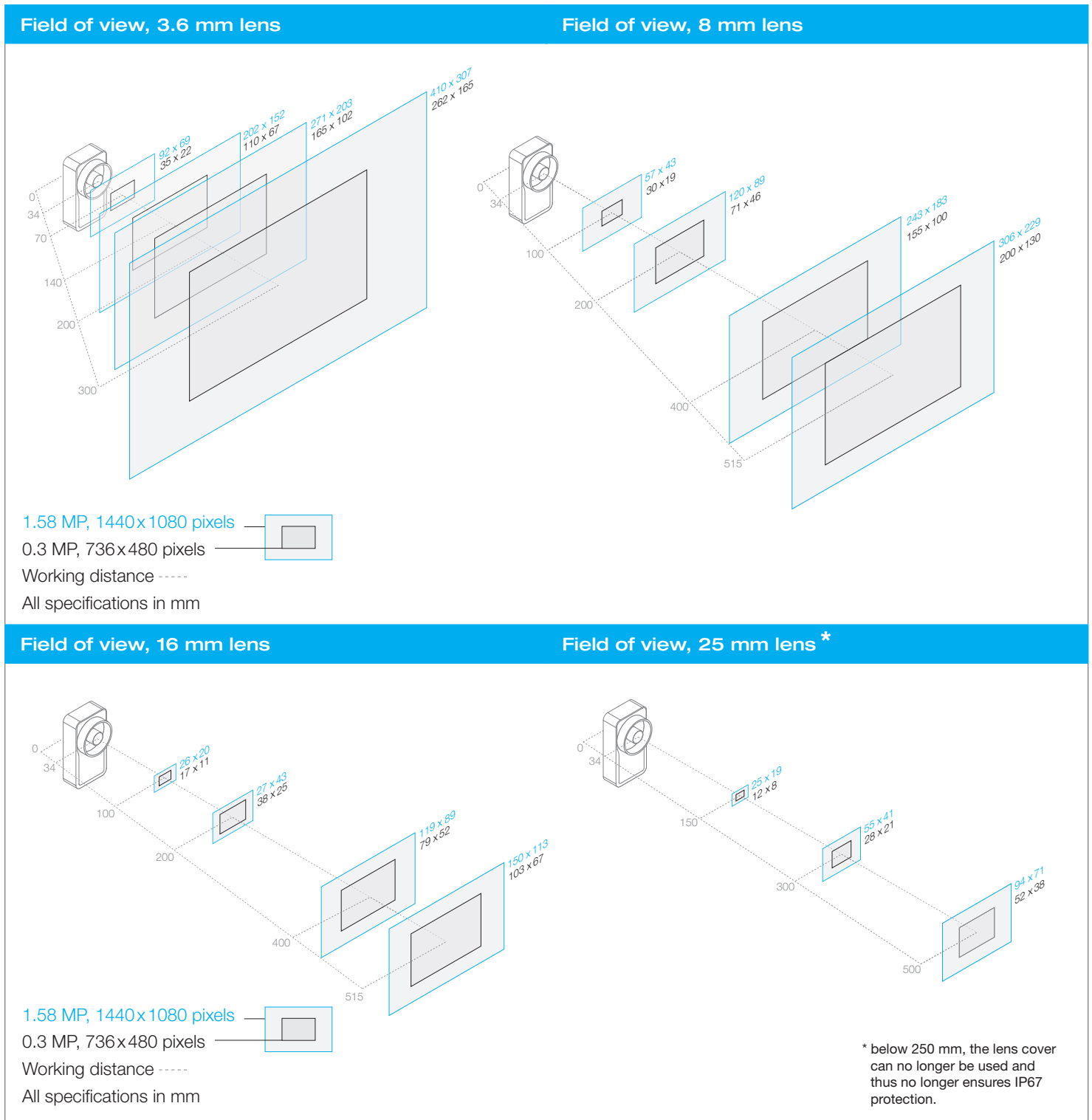




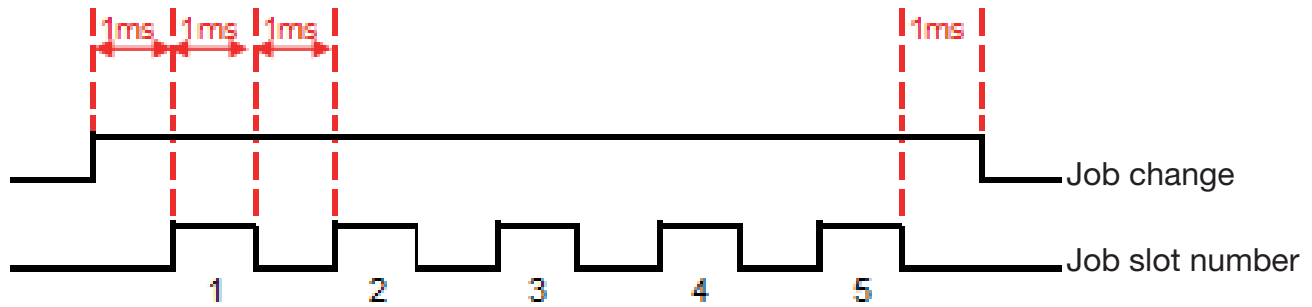
# FIELDS OF VIEW

## CS-60

The following table shows the representation of fields of view with the available lenses at various working distances for the CS-60 with 736 x 480 pixels (0.3 MP) and 1440 x 1080 pixels (1.58 MP). Working distance: Back edge sensor to worktop. Depth of sensor: 34 mm.



## Change job when using the inputs



To do this, use the inputs 0 and 1. The PLC sets a high signal to the line 0 “Change job” and then sends a series of impulses (1 ms hold time) to line 1 “Job selection.” The number of impulses then corresponds to the job number, e.g. 5 impulses = job number 5. After the 5th impulse and a wait time (Low side) of 2 ms, the signal to line 0 is then canceled (Low side).

## HMI recommendation

The nVision-i software comes pre-installed on the following Windows-based panels upon delivery. This enables a complete set-up of the CS-60 family as well as visualization via commonly used browsers such as Google Chrome, Firefox or Edge.

ARCHMI-912ARH74600-DIC	(12 inch, resistive display)
ARCHMI-912APH74600-DIC	(12 inch, capacitive display)
ARCHMI-915ARH74600-DIC	(15 inch, resistive display)
ARCHMI-915APH74600-DIC	(12 inch, capacitive display)

The following panels can only be used for visualization purposes via an automation browser. Android 10 is used as the operating system. The following types are available for selection:

JWS101-A210-3288432KY-A	(10 inch, capacitive display, automation browser, Android 10.0)
JWS121-A210-3288432KY-A	(12 inch, capacitive display, automation browser, Android 10.0)
JWS121-A210-3288432KY-A	(15 inch, capacitive display, automation browser, Android 10.0)

For information about prices and delivery times, please contact the company Wachendorff directly via the following contact info:

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