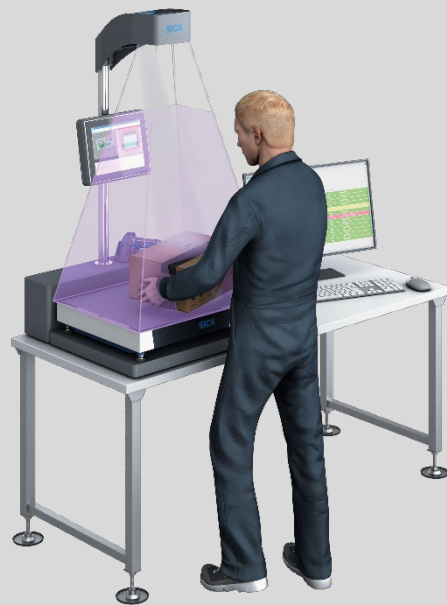


Master Data Analyzer Vision

Track and trace system

SICK
Sensor Intelligence.



Described product Master Data Analyzer Vision

System no. 8027513

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1 ABOUT THIS DOCUMENT

1 About this document

This document on MDA Vision:

- Contain information that is required during the life cycle of the system.
- Must be available to all those who work with the system.
- Read through the document carefully to ensure that you have fully understood its contents before working with the system.

1.1 Limitation of liability

Applicable standards and regulations, the latest technological developments, and our many years of knowledge and experience have all been taken into account when assembling the data and information contained in this document.

The manufacturer accepts no liability for damage caused by:

- Failure to observe this document.
- Non-compliance with notes and regulations.
- Unauthorized mounting and installation.
- Unauthorized technical and other changes.
- Use of unauthorized spare parts, wear and tear parts, and accessories.
- Unauthorized changes, adjustments, and/or manipulations of software.
- Failure to perform and document regular maintenance work.

The actual scope of delivery may differ from the features and illustrations shown here where special variants are involved, if optional extras have been ordered, or as a result of the latest technical changes.

1.2 Scope

This document applies to the following product variants:

- MDAV-L632
- MDAV-L632-HH
- MDAV-L654-HH-IC
- MDAV-L654-IC

1.3 Target groups

This document is intended for qualified persons who operate the system.

1.4 Further information

Special local conditions

The local laws, regulations, technical rules and internal company operating instructions at the installation location must be observed.

Storage of documents

This document and other relevant technical documentation/information:

- Must be kept available for reference.
- Must be handed over to new system operators/new specialist personnel.

1.5 Other relevant technical documentation/information

- Technical system documentation
- Technical data
- MDA-Vision quickstart
- Customer interface description

- Operating instructions for the following system components:

Operating instructions	Manufacturer
Visionary-S AP quickstart	SICK
Lector65x Flex Focus quickstart	SICK
Lector63x Flex C-Mount quickstart	SICK
IDM cable-bound mobile handheld scanner quickstart	SICK
BC shipping scale maintenance manual and certificate	METTLER TOLEDO
S16 Dual Flex operating instructions	MOBOTIX
SIM2000-2 P Sensor Integrated Machine operating instructions	SICK

1.6 Document conventions

- ▶ Instructions

All measurement units used in this document are metric.

Subject to change without notice.

Figures may differ from the actual design.

2 For your safety

2.1 Intended use

MDA Vision is a stationary DWS (**D**imensioning-**W**eighing-**S**canning) system.

It enables master data for products to be logged in a standardized manner, for example for goods entry or shipping. The products are measured, weighed, identified, and visualized in a single operation.

The master data set can be supplemented to include custom additional information such as information on the measurement staff, the measurement location, or on company-specific object information.

The processing of the data takes place in real time.

With the WLAN module available as an accessory, data can be output independently of the location.

NOTE! Intended use also includes observance of this system description, in particular the safety notes as well as the repair and maintenance requirements.

Code reading

At the factory, MDA Vision is set to decode a single code. The code can be of different types per read process. If there are several codes on the recorded Lector image, they cannot be reliably detected.

NOTE! If special conditions or detection logics are required by the user, this can be configured by SICK Service.

2.2 General safety notes

- ▶ Please read this document through carefully and observe all the safety notes and information before working with the MDA Vision.
- ▶ Only qualified persons from the relevant departments are permitted to work on the MDA Vision.
- ▶ Follow operating processes.
- ▶ Follow local regulations.
- ▶ Follow all local regulations relating to working with electrical components.
 - Only authorized persons are permitted to access the MDA Vision.

System damage/transport damage

Damage to the individual components can lead to malfunctions of the system as a whole.

- ▶ Do not ignore any damage caused to system components during transport.
- ▶ In case of damage, contact SICK Service.

2.3 Requirements for the qualification of personnel

Any work on the product may only be carried out by personnel qualified and authorized to do so. Qualified personnel are able to perform tasks assigned to them and can independently recognize and avoid any potential hazards. This requires, for example:

- technical training
- experience
- knowledge of the applicable regulations and standards

2.4 Sources of danger

⚠ WARNING!

HAZARDOUS LASER RADIATION

The Lector6xx image-based code readers work with a laser class 1 aiming laser.

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

- ▶ Never look directly into the laser beam.
 - ▶ Never point the laser beam at people's eyes.
 - ▶ During commissioning or maintenance work, suitable eye protection must be worn.
 - ▶ Avoid laser beam reflection caused by reflective surfaces.
In particular during mounting and alignment work.
 - ▶ Do not open the housing.
 - ▶ Current national regulations regarding laser protection must be observed.
-

⚠ WARNING!

DANGEROUS LED RADIATION

The Lector63xx image-based code reader uses LEDs of the risk group RG1.

Visible radiation, 400 nm to 780 nm.

The LEDs may pose a danger to the eyes in the event of incorrect use.

- ▶ Do not intentionally look into the light source.
 - ▶ Do not point the light source at people and prevent reflections of the light source from reflective surfaces onto people.
 - ▶ During commissioning or maintenance work, suitable eye protection must be worn.
 - ▶ Do not open the housing.
 - ▶ Comply with the recent national version of the applicable standards on photobiological safety of lamps and lamp systems.
-

⚠ DANGER!

HAZARDOUS ELECTRICAL VOLTAGE

Touching live devices, which may still be energized, can lead to death, burns or electrical shock.

- ▶ Electrical work may only be performed on the system by qualified specialist personnel.
 - ▶ Before working on electrical components, observe the five safety rules:
 - ▶ Disconnect.
 - ▶ Secure against being switched back on.
 - ▶ Ensure that there is no voltage.
 - ▶ Ground and short-circuit.
 - ▶ Cover or enclose live parts in the vicinity.
-

⚠ DANGER!

SUSPENDED LOADS

- ▶ Never enter the area under suspended loads.
 - ▶ Pay close attention when lifting loads.
 - ▶ Comply with lifting instructions to prevent injuries and accidents.
 - ▶ Use suitable, undamaged lifting tools.
 - ▶ Wear personal protective equipment (safety helmet, safety shoes).
-

2.5 Protective devices

MDA Vision is built so that the system can be operated safely. Protective devices reduce potential risks to the maximum possible extent.

2.6 Warranty

No warranty claims will be accepted if:

- The safety notes and measures in this document are not observed.
- Parts or components of the MDA Vision are installed, mounted or modified without authorization.
- The MDA Vision is changed or modified.
- The software has been modified, customized, and/or tampered with without authorization.
- The connection unit has been opened by the user.

2.7 Safety conventions

The warnings used in this manual have the following meanings:






- **DANGER**
Indicates a situation presenting imminent danger, which will lead to death or serious injuries if not prevented.
- **WARNING**
Indicates a situation presenting possible danger, which may lead to death or serious injuries if not prevented.
- **CAUTION**
Indicates a situation presenting possible danger, which may lead to moderate or minor injuries if not prevented.

NOTE!




Important information and useful notes.

2.8 Warning symbols on the system components

Warning labels must not be removed or covered up. If labels are missing, these must be affixed. Damaged labels must be replaced.

Symbol	Meaning
	Hazardous point warning
	Hazardous electrical voltage warning
	Optical radiation warning
	Laser light warning
	Suspended load warning

2.9 Mandatory symbols

Symbol	Meaning
	Read document
	Use foot protection
	Disconnect before maintenance or repairs

3 System description

3.1 Component overview

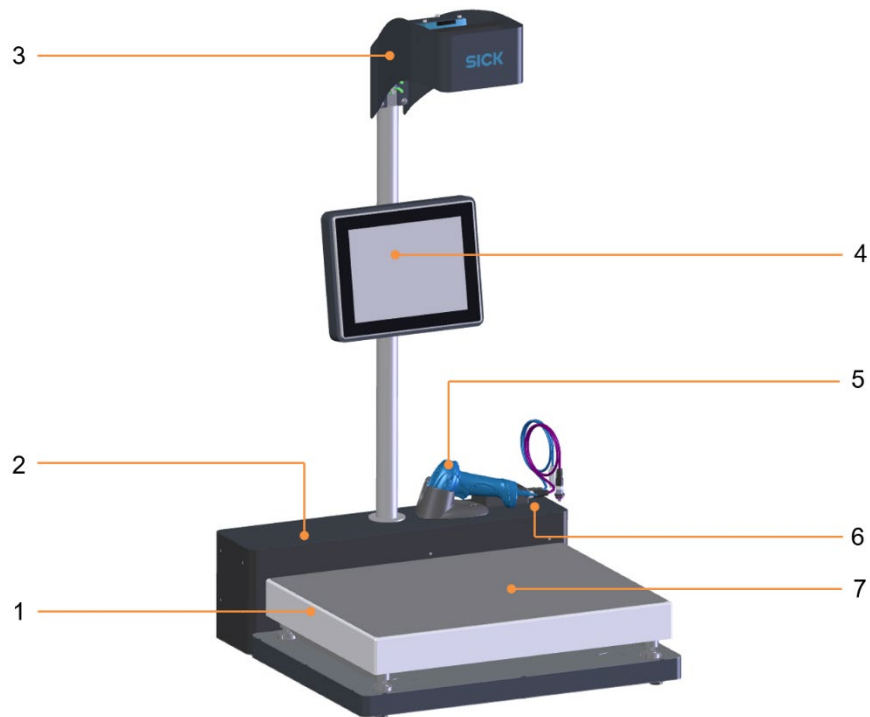


Fig. 1: Component overview

Legend

- | | |
|---|---|
| 1 | Base plate |
| 2 | Connection unit with system controller |
| 3 | Sensor head |
| 4 | Display for configuring the system and displaying the measurement results |
| 5 | Mobile handheld scanner for manual code reading (optional) |
| 6 | WLAN module for mobile use of the MDA Vision (accessory) |
| 7 | Rugged electronic scale for holding the measuring objects |
-

Sensor head components



Fig. 2: Sensor head components

Legend

- 1 Visionary-S 3D snapshot camera for determining dimensions and recording an image (1 megapixel)
- 2 Lector65x or Lector63x image-based code reader for code reading
- 3 Rugged color camera (optional) for high-resolution images (6 megapixels)
Prerequisite for cropping function

3 SYSTEM DESCRIPTION

3.2 Visionary-S 3D snapshot camera



Fig. 3: Visionary-S 3D snapshot camera

Legend

- | | |
|---|--|
| 1 | Infrared camera on both sides (depth information) |
| 2 | RGB color camera (color information) |
| 3 | Projector for emitting structured infrared light (dot pattern) |
-

Features

- Visionary-S is a 3D color camera based on the stereo principle.
- It delivers real-time 3D data at 30 frames per second (fps).
- The Visionary-S 3D vision camera combines structured illumination with the proven technology of a color camera.
- It delivers color depth images with more than 320,000 depth and color intensity values in just one shot.

Basic principle

- The snapshot camera works similarly to a human pair of eyes.
- Two cameras take two images of an object from two different positions and calculate the 3D depth information using the triangulation principle.
- The emission of structured light helps to give the images a clear and predefined, familiar structure.
- The additional use of the integrated color camera helps with edge detection.

Details

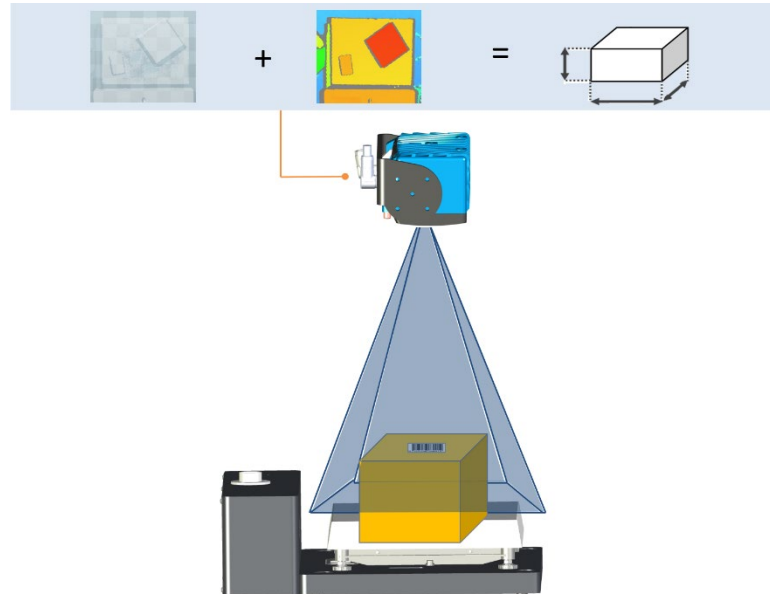


Fig. 4: Functionality of the Visionary-S

- Structured infrared light is emitted over a wide area in the field of view of the snapshot camera.
- The infrared dot pattern is deflected accordingly by the height differences when it hits the surface.
- The image information from the two infrared cameras is offset. A depth image is generated based on the respective deflection of the point pattern.
- In addition, the color image of the camera is evaluated. The color information helps to detect the object in case of low contrast depth image information or background noise.
- A 3D point cloud is generated based on the two pieces of image information.
- This forms the basis for calculation of the dimension values.
- The dimension results are transmitted to the system controller for further processing.

Color image recording

The Visionary-S 3D camera records an image of the complete scene.

NOTE! Cropping is not supported. The dynamic cropping functionality of the IP camera must be used (see [3.7.2 High-resolution color camera](#)) for cropping camera images.

Status indicators



Fig. 5: Status indicators of the Visionary-S

Legend

- | | |
|---|-----------------|
| 1 | Device LED |
| 2 | Application LED |

3.3 Lector6xx image-based code reader



Fig. 6: Lector6xx image-based code reader

Legend

- | | |
|----|---|
| 1 | Lector65x code reader |
| 2 | Lens |
| 3 | Protective cover for optics |
| 4 | Integrated LED illumination ring |
| 5 | Opening in illumination for cross-shaped aiming laser (laser alignment aid) |
| 6 | Lector63x code reader (alternative) |
| 6a | 2 openings in illumination for point-shaped aiming laser |

Features

- Optical sensor with integrated LED illumination unit and dynamic focus control for code reading.
- Allows the omnidirectional reading of bar codes on one side of an object, even with varying object heights and code positions.
- With the Lector65x, an aiming laser creates a red cross in the field of view on the object and makes it easier to align the object for successful code reading. See figure.
- With the Lector63x, alignment is performed via two red light lasers. These each create a red dot in the field of view. See figure.

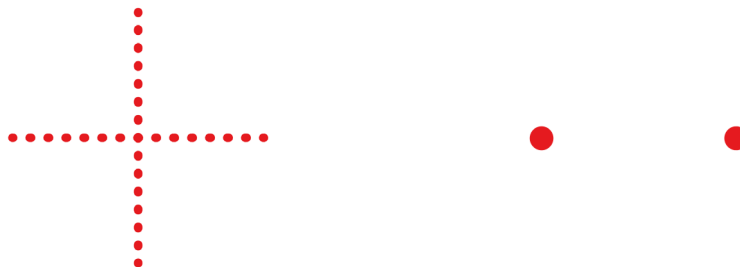


Fig. 7: Aiming laser of the Lector 654 (left) and Lector 632 (right)

Function

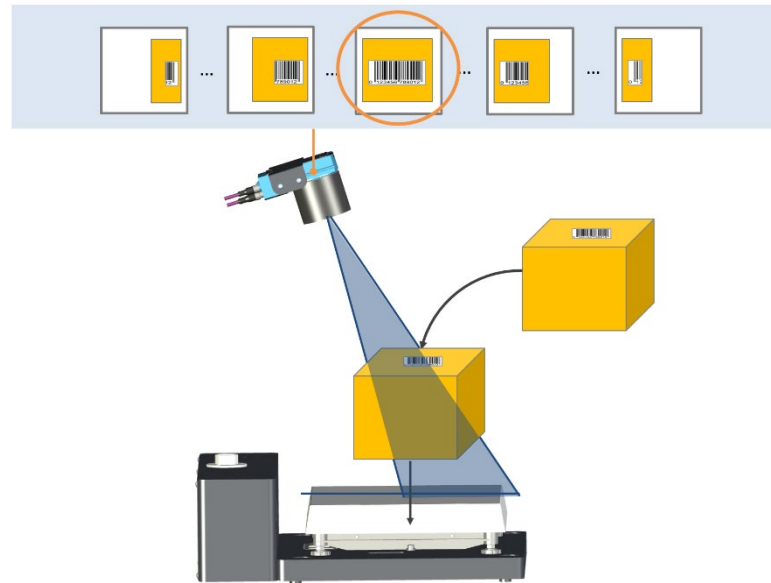


Fig. 8: Operating principle of the Lector65x code reader

- The Lector6xx is mounted at an angle in the sensor head so that the code of the objects can be read as soon as they enter the camera field of view.
- The image-based code reader creates photos and searches for code information within them.
- The code reading process starts as soon as the Visionary-S detects a change in the field of view.
- For the image recordings, the reading field is lit up with a powerful LED illumination unit.
- The code information on the photos is extracted and processed by the integrated decoding unit.
- The code that was read is transmitted to the system controller for further processing.

3 SYSTEM DESCRIPTION

Lector6xx status indicators



L654



L632

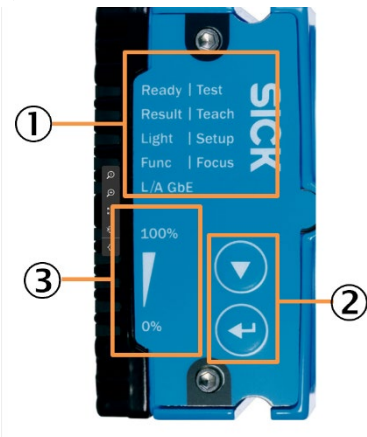
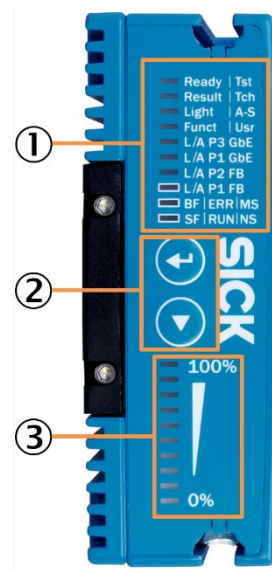


Fig. 9: Status indicators of the 6xx code readers front and top view

Legend

- ① LED status display
- ② Function buttons
- ③ Bar graph

3.4 Electronic scale



Fig. 10: Components of the electronic scale

Legend

- | | |
|---|--|
| 1 | Scale frame with adjustable feet and spirit level |
| 2 | Precision load cell |
| 3 | Separate scale display (only for setting the geo code) |
| 4 | Sheet metal cover for holding the weighing objects |
-

Features

- Weight determination after placing the object on the sheet metal cover.
- Transmission of the determined weight value to the system controller.
- Display of the weight value together with the dimension values and the code in the measurement window of the MDA Vision display.
- The separate scale display is installed in the base plate of the MDA Vision at the factory.
- It makes it possible to set the geo code. This compensates for differences in gravity between the location in the factory (where the scale was calibrated) and the installation location of the scale.

3 SYSTEM DESCRIPTION

3.5 Connection unit



Fig. 11: Connection unit

Legend

- 1 User connection area and main switch
 - 2 Seals
-

Connection area

- Connection of the MDA Vision to local voltage supply and user network
- Connection of the mobile handheld scanner (optional)
- Connection of the WLAN module (accessories)
- Switch for switching the system on and off For detailed information, see section [5 Electrical installation](#).

System controller

- Contains the system controller, the control unit of the MDA Vision.
- The system controller coordinates the incoming and outgoing signals and processes the received measurement and read results.
- Data output according to host telegram to the user system via the Ethernet interface.
- If necessary, separate output of camera images (Visionary-S, high-resolution camera)

LOSS OF THE RIGHT TO WARRANTY

The connection unit is provided with a seal against unauthorized opening. The user is not allowed to open the connection unit.



- ▶ Do not open the connection unit.
 - ▶ If the device is opened, any warranty claims against SICK AG will be void.
-

3.6 Operating and reading unit

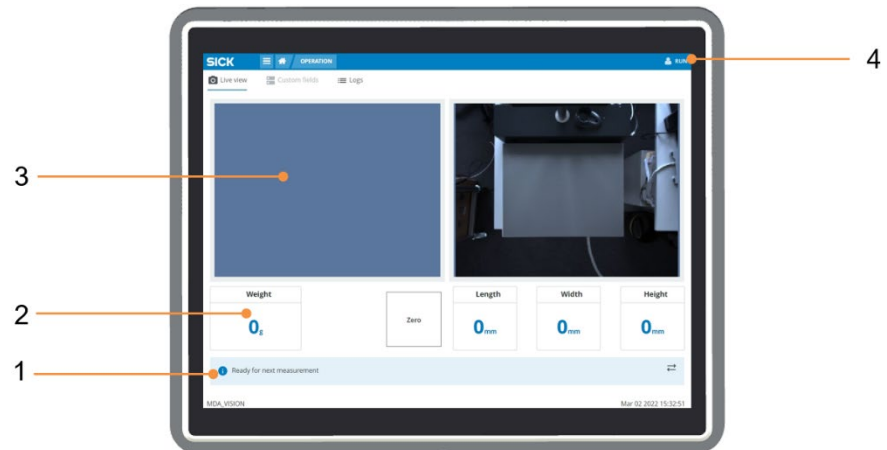


Fig. 12: Operating and reading unit

Legend

- | | |
|---|--|
| 1 | Status indicator |
| 2 | Displaying the measurement results |
| 3 | Visualization of the measurement process |
| 4 | Configuration area |

Features

- Touch-sensitive screen
- Operating height is adjustable via the tube rod.
- Used to input and output information.

Function

- Central visualization and operating unit of the MDA Vision.
- It displays all measurement results and allows for convenient configuration of the system.

3 SYSTEM DESCRIPTION

3.7 Optional components

3.7.1 IDM260 mobile handheld scanner



Fig. 13: IMD260 mobile handheld scanner

Features

- Cable-bound mobile handheld scanner for manual code reading.
- The mobile handheld scanner recognizes 1D and 2D codes and all common stacked codes.
- This connecting cable is used to both supply the mobile handheld scanner with voltage and transmit data.

Function

- Allows for manual code reading if the code cannot be read by the Lector6xx. This can be the case, for example, with objects where the code is on the object side and which cannot be tilted for the measurement process (e.g. open boxes) or if the codes are very small.
- The mobile handheld scanner can also be used as an alternative to automated code reading by the Lector6xx.

3.7.2 High-resolution color camera



Fig. 14: High-resolution color camera

Properties

- High-resolution color camera with a resolution of 6 MPX.
- The camera is supplied with voltage via a mini USB cable.
- The control unit is installed in the
- connection unit at the factory.

Function

- Creates a high-resolution color image of the object during the measurement process.
- The photo is transmitted to the higher-level user system together with the measurement data as an alternative to the camera image from the Visionary-S 3D snapshot camera.

Cropping function

- The dynamic cropping function of the IP camera allows the camera images to be cropped to the object using the dimensioning data.
- Focus on the measured object.
- Advantage of a reduced amount of data for image output.

NOTE! The cropped camera image is not displayed on the operating and reading unit. It is output to the user system in file form only.

3 SYSTEM DESCRIPTION

3.8 Accessories

3.8.1 WLAN module

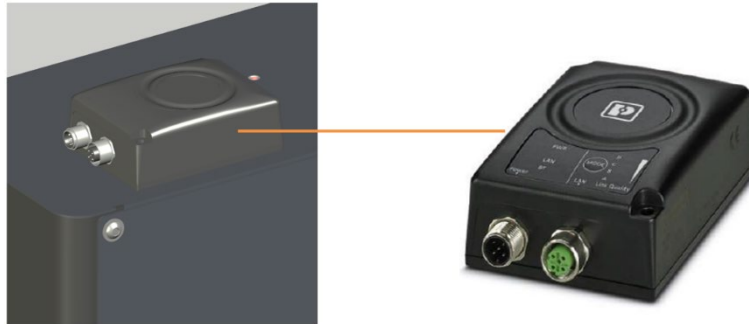


Fig. 15: WLAN module

Features

- WLAN Ethernet port adapter for industrial networks.
- Mounted on the connection unit housing.
- The WLAN Ethernet Port Adapter has a circular, polarized 5 dB directional antenna that also enables it to be used in surroundings with a high number of reflections from metals.
- The WLAN Ethernet Port Adapter enables the Ethernet interface to be connected wirelessly to a WLAN access point.

Function

- This enables measurement results to be transmitted to the user system when using the MDA Vision in a mobile setup, regardless of the measurement location.

NOTE!

- ▶ Observe all local guidelines regarding the use of radio technology.

3.9 Data output and output of the camera images

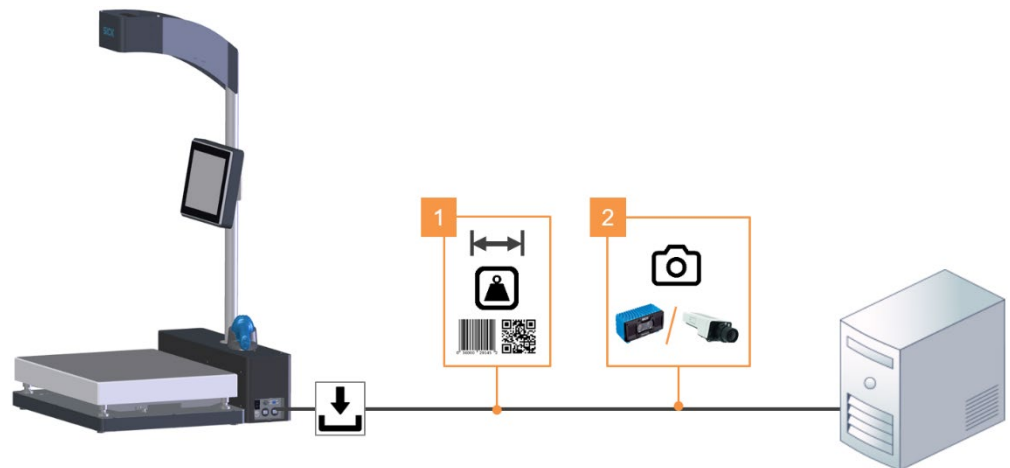


Fig. 16: Data output and output of camera images

Legend

- 1 Output of measurement results via TCP data string or via FTP (as client).
Alternatively, the results can be output in a result file via FTP or via a 2D code shown on the display.
The MDA Vision can be configured as a TCP client or as a TCP server.
 - 2 Output of the camera image with the measuring object.
The camera image of the Visionary-S or (optionally) the high-resolution image of the IP camera can be used.
The MDA Vision can be configured as an FTP client to output the camera image.
-

Data format

- Output format and file names are preset by default (see *Customer Interface Description* supplement).
- The output data string, the naming of the files and the file extension can be adapted by SICK Service.

3.10 Operating principle

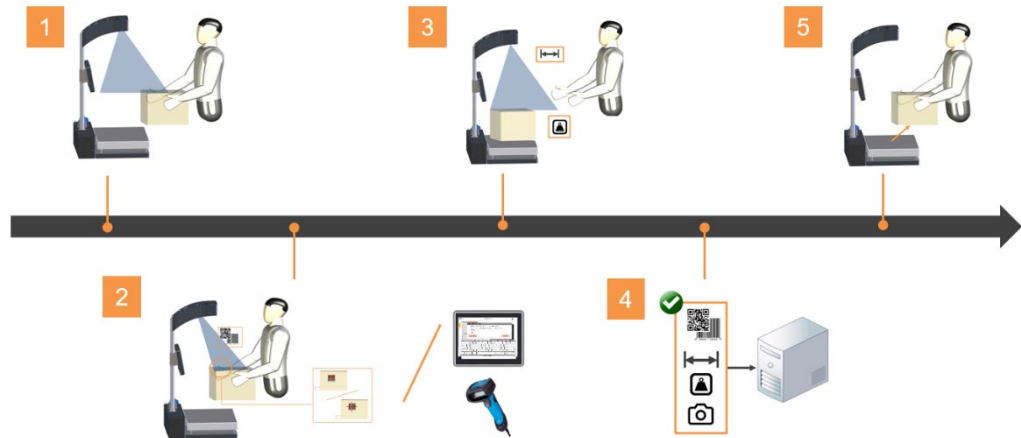


Fig. 17: Operating principle

Legend

1 **Starting measurement**

- Bring the object into view of the 3D snapshot camera.

The Lector6xx image-based code reader is activated. LED illumination and aiming laser are switched on.

2 **Automatic code reading**

At the factory, MDA Vision is set to decode a single code. The code can be of different types per read process.

If there are several codes on the recorded Lector image, they cannot be reliably detected.

NOTE! Custom acquisition logic or conditions can be configured by SICK.

Manual code reading

Enter the code on screen, or capture it with the mobile handheld scanner if automatic code reading is unsuccessful.

3 **Measurement value determination**

- Place the object on the scale after successful code reading.
- Release object.

As soon as the object is free on the scale, weight and dimension values are determined and displayed.

4 **Data output and output of the camera images**

Immediate output of measurement and read data as well as camera images when a network connection is established.

Exception: When manual measurement data manipulation is activated, the data is only transmitted after removal of the object from the scale.

With the WLAN module available as an accessory, data can be output independently of the location.

5 **Completing measurement process**

Remove the object from the scale.

All measured values are reset to zero.

4 Transport, setup, and mounting

All transport, assembly, mounting, and electrical installation work must only be carried out by qualified persons.

4.1 Transporting MDA Vision to the place of use

MDA Vision is delivered in a sturdy box on a transport pallet and transported to the place of use by the user.



Fig. 18: Transport to the place of use

Checking delivery for visible damage

- ▶ Check delivery for visible transport damage.
- ▶ Document and report transport damage.

4 TRANSPORT, SETUP, AND MOUNTING

Transport with manned forklift truck/lifting truck

- ▶ Use a manned forklift truck or suitable lifting truck to transport the transport box.
- ▶ Pick up the transport pallet with the forks.
- ▶ Make sure that the center of gravity is in the center between the forks and that the forks are completely entrenched under the transport pallet.
- ▶ Always transport the transport box upright and horizontally.
- ▶ Carefully set down the pallet at the place of use.

⚠ DANGER!

SUSPENDED LOADS

During transport to the place of use, tipping or falling loads pose a risk of severe injury or damage to property.

- ▶ Only use lifting equipment which is suitable for the weight and dimensions of the freight.
 - ▶ Never enter the area under suspended loads.
 - ▶ Pay close attention when lifting loads.
 - ▶ Comply with lifting instructions to prevent injuries and accidents.
 - ▶ Wear personal protective equipment (safety helmet, safety shoes).
 - ▶ Observe all local safety and work safety regulations.
-

4.2 Disassembling the transport box

- MDA Vision is delivered partially assembled.
- The individual parts are packaged to protect them from shocks.

NOTE! All work relating to the installation of the device must only be done in consideration of the relevant safety regulations.



Fig. 19: Disassembling the transport box

- ▶ Loosen the conveyor belts.
- ▶ Remove the lid.
- ▶ Remove side panels and discard foam inserts.

The individual assemblies are now accessible from all sides.

4.2.1 Scope of delivery

- ▶ Check for completeness.
- ▶ Document transport damage.



Fig. 20: Scope of delivery

Legend

- | | |
|---|--|
| 1 | Base plate with pre-assembled support tube |
| 2 | Power supply unit including power cables
(1x protective contact (CEE 7 / VII), 1x NEMA, 1x C14) |
| 3 | Sensor head with pre-assembled sensors |
| 4 | Scale frame |
| 5 | Sheet metal cover |
| 6 | WLAN module (accessory) |
| 7 | Mobile handheld scanner (optional) |
| 8 | Bag with screws and small parts |

Bag contents

- Screws for mounting the sensor head (see section [4.3.3 Mounting and connecting sensor head](#)).
- Key for the PortLock (see section [5.1 Connection overview of connection unit](#)).

4 TRANSPORT, SETUP, AND MOUNTING

4.3 Mounting

4.3.1 Setting up base plate

The MDA Vision is placed on a table and assembled there.

To ensure an ergonomic working height, we recommend using the table available as an accessory or a height-adjustable table where the operating height can be optimally adjusted for the user.

NOTE! The table must be stable, of a sufficient size and secured against rolling away.

⚠ DANGER!

RISK OF INJURY DUE TO DEVICE TIPPING OVER

There is a risk of the MDA Vision tipping over during assembly work.

The device tipping over can lead to the severe crushing or even loss of limbs. There is also the risk of inflicting damage to the device.

- ▶ Place the base plate on a stable and non-tilting table.
- ▶ Secure the table to prevent rolling away.

⚠ DANGER!

DANGER OF CRUSHING WHEN SETTING DOWN THE BASE PLATE

The adjustable feet are designed so that the safety distance between the bottom of the device and the tabletop can be observed.

There is a risk of crushing when placing the base plate on the tabletop.

- ▶ Do not put your hands under the base of the housing when installing the base plate.
-

Design

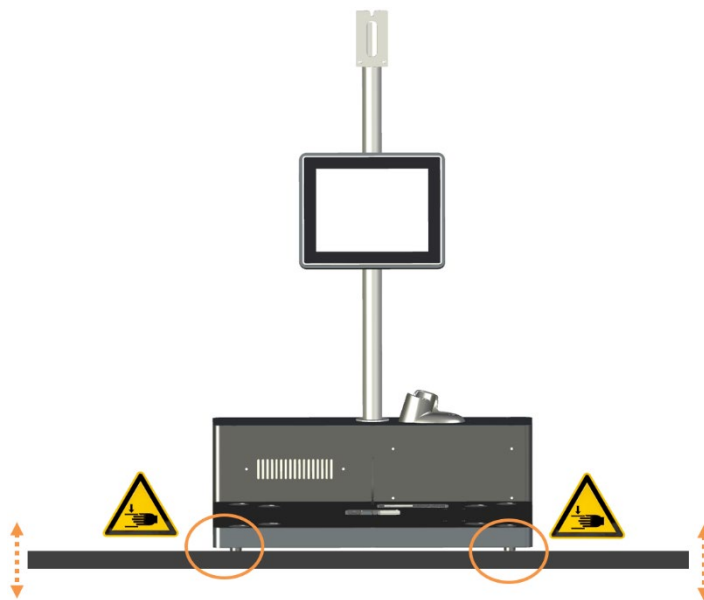


Fig. 21: Setting up the base plate

- ▶ Place the base plate with connection unit and pre-assembled support tube on a table.

NOTE! The six adjustable feet must be fully positioned on the tabletop.

4.3.2 Setting up and connecting the scale

The electronic scale is placed on the base plate, where it is then connected and assembled.

Pre-assembly (factory)

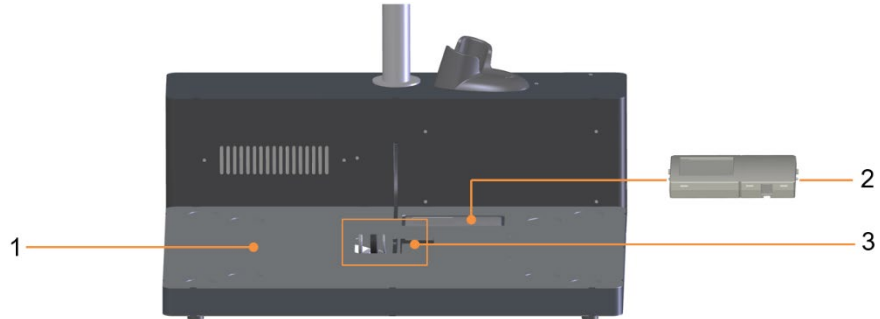


Fig. 22: Pre-assembly of base plate (factory)

Legend

- 1 Positioning area
- 2 Scale display
- 3 Connecting cables

- The scale display is pre-assembled in the base plate.
- Three cables for connecting the electronic scale are led out of the base plate at the factory.

Placing scale frame

- ▶ Place the scale frame on the base plate.

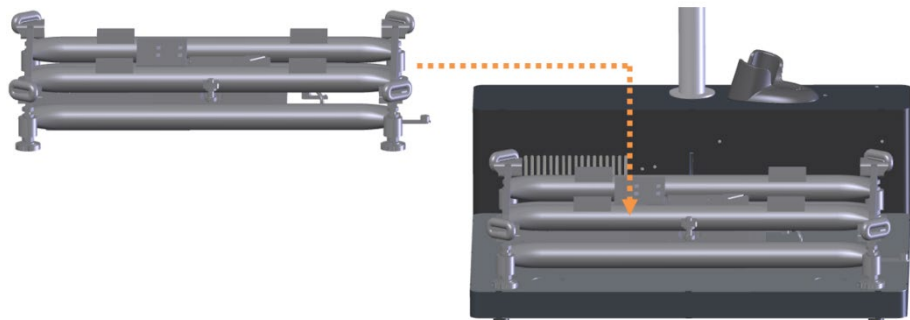


Fig. 23: Placing scale frame on base plate

4 TRANSPORT, SETUP, AND MOUNTING

Connecting electronic scale

The electronic scale is connected via the connection unit on the underside of the scale frame.

- ▶ For connection, tilt the scale frame upwards by 90° on the base plate to allow access to the connection unit.

To do this, grasp the scale frame at the front with both hands and fold it upwards like a lid.

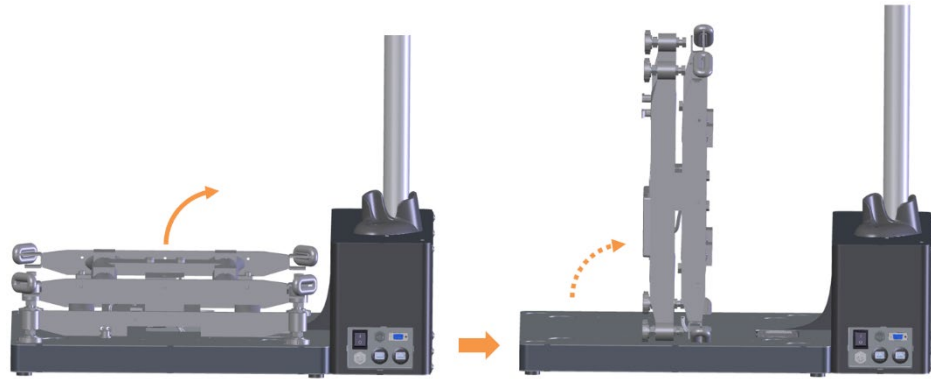


Fig. 24: Tilting the scale frame to connect the cables

- ▶ Hold the upright scale with one hand in the tilted position.
- ▶ Connect the cables to the connection unit as follows.

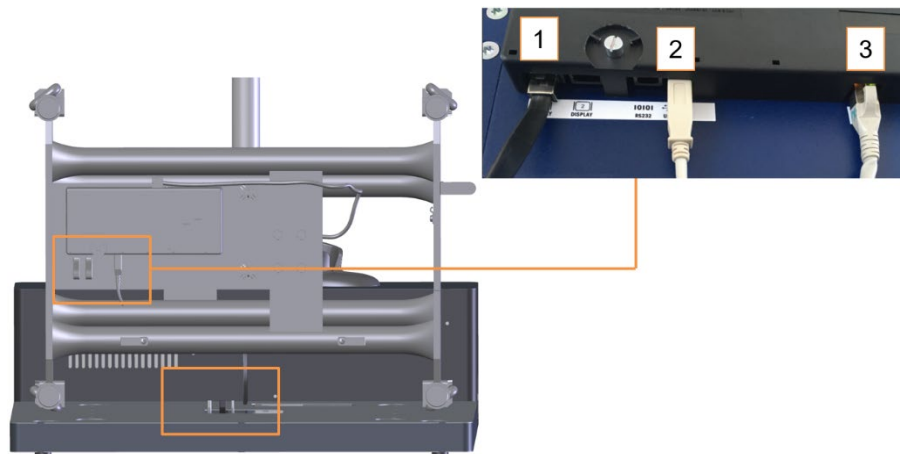


Fig. 25: Connecting the cables to the connection unit of the scale

Legend

- | | |
|---|---|
| 1 | Connection of scale display |
| 2 | USB B cable connection (voltage supply) |
| 3 | Ethernet cable connection |

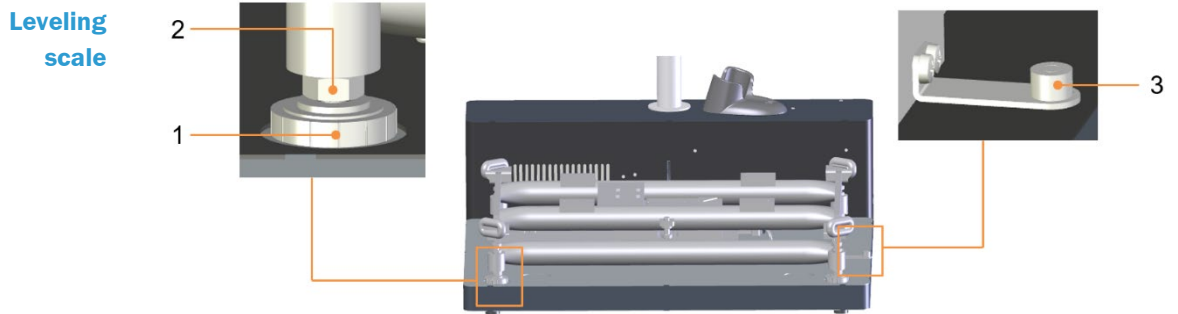


Fig. 26: Leveling the scale frame

Legend

- 1 Adjustable foot
- 2 Hexagon nut
- 3 Spirit level

- ▶ Place the scale frame back on the base plate. When setting it down, make sure that the connecting cables are not disconnected.
- ▶ Level the scale with the help of the installed spirit level. To do this, turn the adjustable feet on the bottom of the device.
- ▶ Adjust the feet so that the scale is stable and does not wobble.
- ▶ After leveling, tighten hexagon nut firmly.

Putting on sheet metal cover

- ▶ Place the sheet metal cover on the scale frame. The sheet metal cover is held in position by the rubber grommets on the saucer.

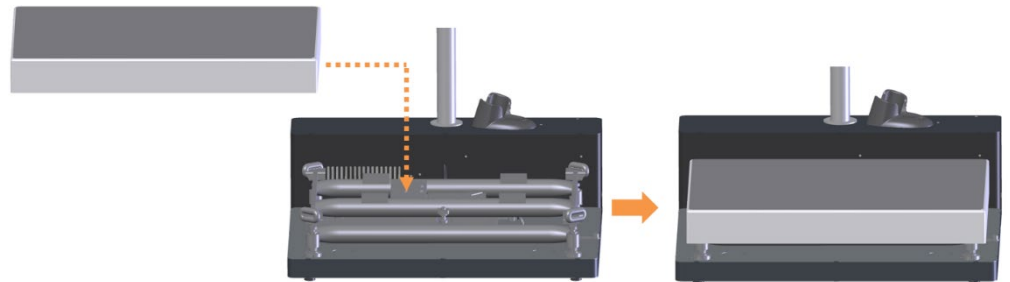


Fig. 27: Putting the sheet metal cover on the scale frame

4 TRANSPORT, SETUP, AND MOUNTING

4.3.3 Mounting and connecting sensor head

All sensor components are mounted in the sensor head in the ordered configuration. The sensor head must be attached to the support tube and the cables leading out of the support tube must be connected to the sensor components.

⚠ DANGER!

SUSPENDED LOADS

The sensor head weighs up to 9 kg, depending on the number of sensor components installed at the factory.

There is a risk of injury from suspended loads and damage to the sensor components during mounting.

- ▶ Perform mounting with 2 persons.
 - ▶ Lift the sensor head in line with ergonomic principles.
 - ▶ Wear safety shoes in addition to personal protective equipment.
-

Pre-assembly
(factory)

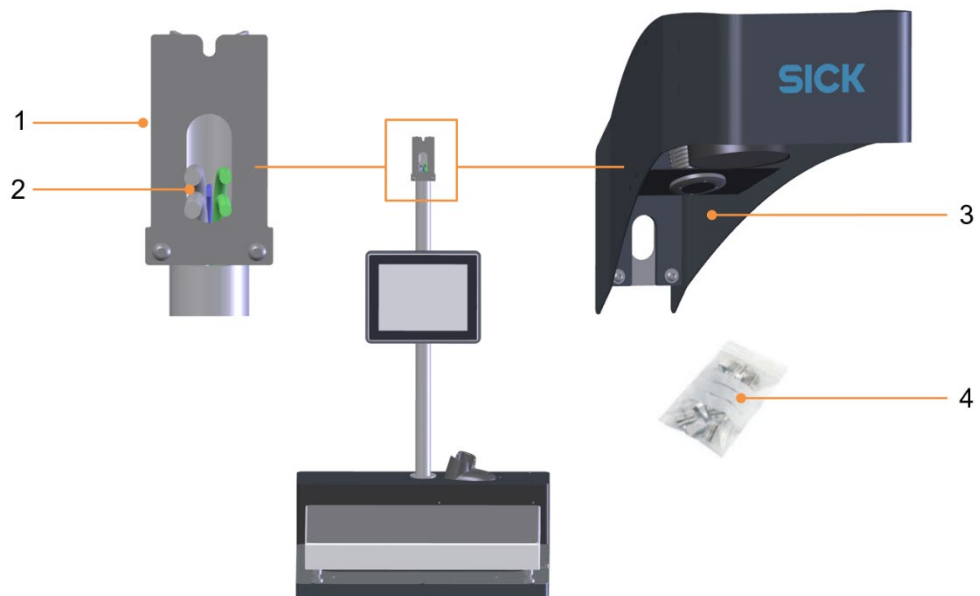


Fig. 28: Support tubes - pre-assembly (at the factory)

Legend

- 1 Support tube with mounting plate
 - 2 Cables led out of support tube with connection plugs
 - 3 Sensor head with pre-assembled sensor components and mounting plate
 - 4 Bag with screws for mounting
-

**Hooking sensor box
into mounting plate**

- ▶ Remove the suspension screw from the bag and screw it into the back of the sensor head until it protrudes approx. 5 mm.
- ▶ Hook the sensor head into the recess of the mounting plate of the support tube using the suspension screw.

The sensor head is then in the correct mounting position and is secured against tipping out.

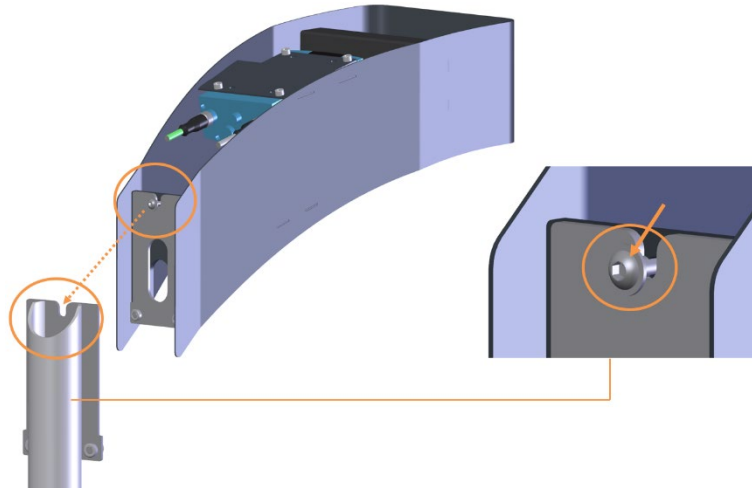


Fig. 29: Hooking sensor head into mounting plate

**Screwing down
sensor head**

- ▶ Remove the two M6 screws from the bag and use them to screw the sensor head to the mounting plate.
- ▶ Hand-tighten the suspension screw and the fixing screws.



Fig. 30: Screwing down sensor head

4 TRANSPORT, SETUP, AND MOUNTING

Connecting sensor components

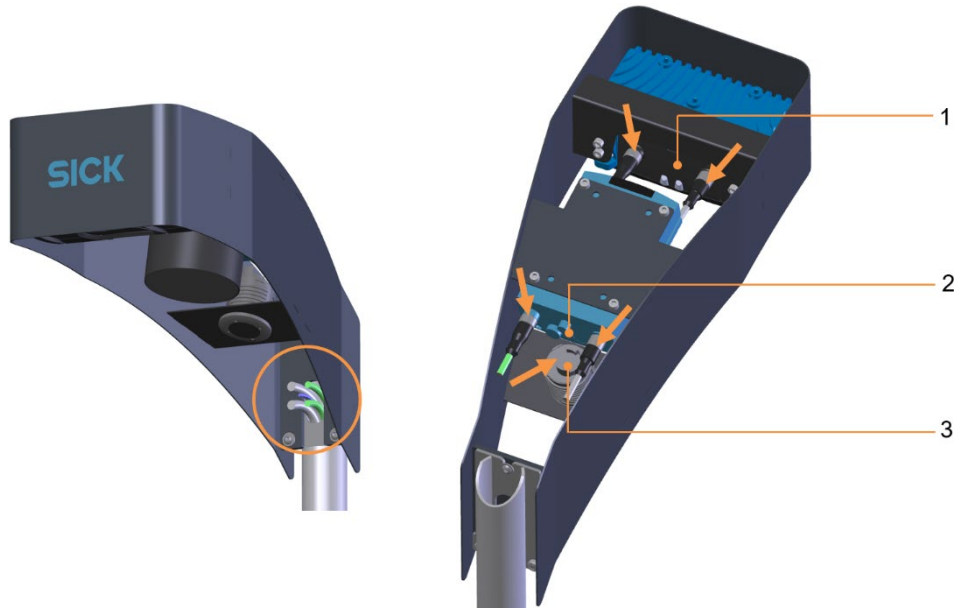


Fig. 31: Connecting sensor components

Legend

- | | |
|---|---|
| 1 | Connection area of Visionary-S 3D snapshot camera |
| 2 | Connection area of Lector6xx |
| 3 | Connection area of color camera |

- ▶ Guide the connecting cables into the terminal compartment of the sensor head. The cables are already connected to the system controller.
- ▶ Connect cables to the sensor components.

Connection of 3D snapshot camera

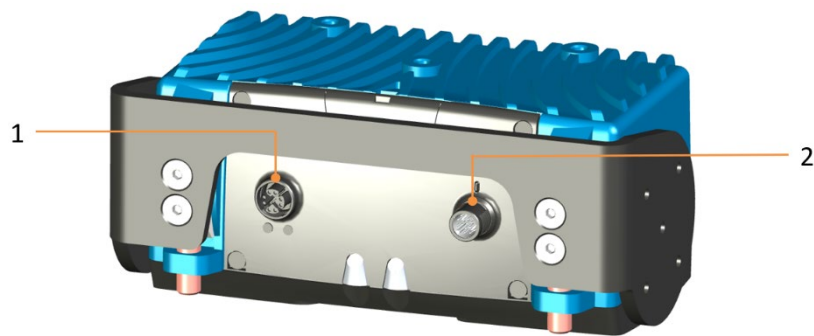


Fig. 32: Connection of 3D snapshot camera

Connection	Function
1	Ethernet
2	Voltage supply

Connection of Lector65x

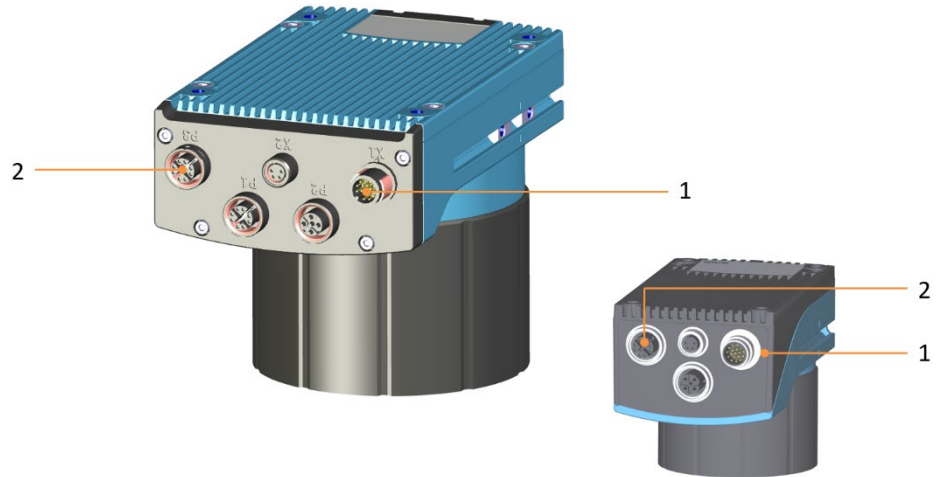


Fig. 33: Lector connection

Connection	Function
1	Voltage supply
2	Ethernet

Color camera connection (optional)

- ▶ Remove the blue locking cap on the back of the camera by turning it clockwise.
- ▶ Insert the mini USB male connector into the female connector on the back of the camera.
- ▶ Screw the blue locking cap back on.



Fig. 34: Color camera connection

4 TRANSPORT, SETUP, AND MOUNTING

4.3.4 Mounting the mobile handheld scanner (optional)

In the configuration with the mobile handheld scanner, the bracket is already mounted on the connection unit.

- ▶ Place the mobile handheld scanner in the rest position as shown.

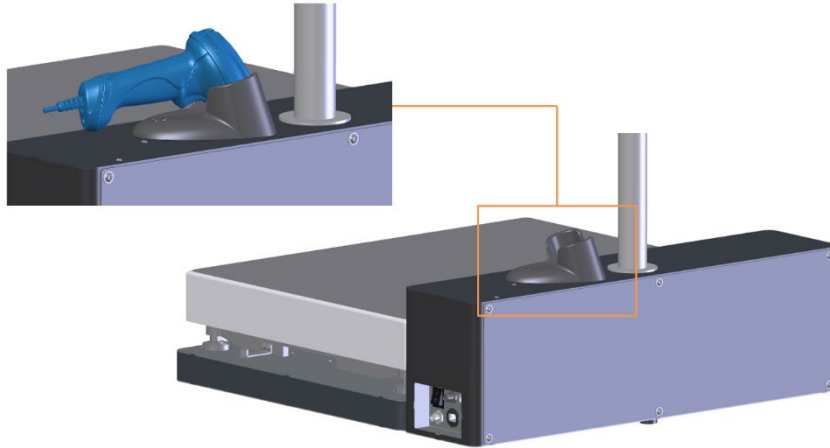


Fig. 35: Mobile handheld scanner on pre-mounted bracket

For information on the connection, see section [5.4 Connecting the mobile handheld scanner \(optional\)](#).

4.3.5 Mount the WLAN module (accessory)

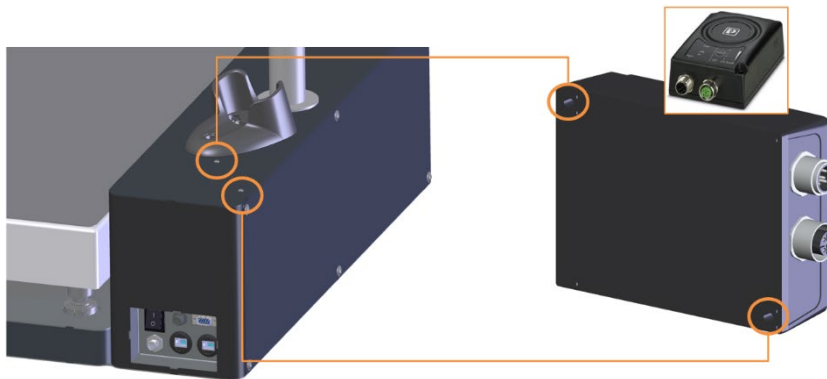


Fig. 36: Mounting the WLAN module (accessory)

Notes on mounting

- The WLAN module, which is available as an accessory, is attached directly to the housing of the MDA Vision.
- The housing wall has two drill holes with the required spacing on the connection unit to accommodate the WLAN module.
- Two fixing screws are included with delivery for this purpose.

Carrying out mounting

- ▶ Place the WLAN adapter with the two drill holes over the wells on the housing.
- ▶ Screw the device tight with the two fixing screws.

For information on the connection, see section [5.5 Connecting WLAN module \(accessory\)](#).

5 Electrical installation

All electrical work may only be performed by qualified persons.

⚠ DANGER!

RISK OF INJURY FROM ELECTRIC SHOCK!

The system is supplied with mains voltage via an external power supply unit. Risk of electrical shock. Contact will result in death, burns or shock.

- ▶ Electrical work may only be performed on the system by qualified specialist personnel.
- ▶ Interrupt the voltage supply.
- ▶ Check residual voltage on the system components.
- ▶ Use extra caution.
- ▶ Always connect equipotential bonding (earthing).
- ▶ Do not disconnect or remove the protective conductor.
- ▶ The voltage supply must be disconnected when attaching or detaching electrical connections.

5.1 Connection overview of connection unit

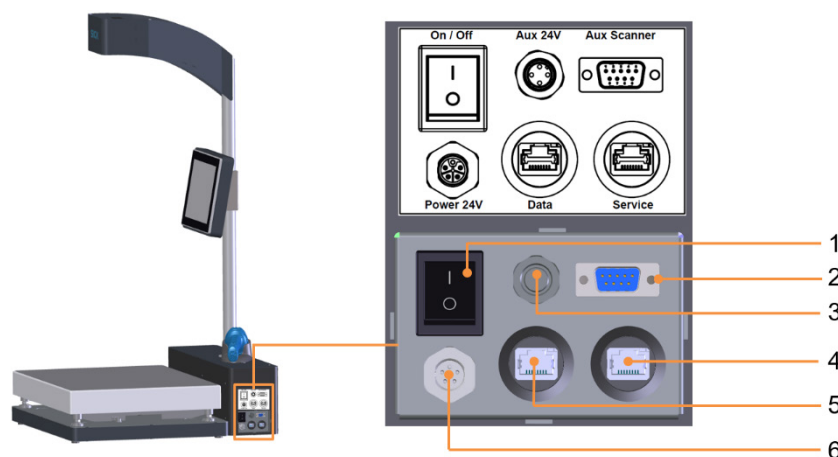


Fig. 37: Connection overview of MDA Vision

Legend

1	On/Off	Main switch for switching the MDA Vision on and off
2	Aux scanner	Serial interface for connecting the optional mobile handheld scanner
3	Aux 24 V	Voltage supply of the WLAN module available as an accessory
4	Service	Ethernet port for connecting a service computer
5	Data	Ethernet port for connecting the MDA Vision to the higher-level user system
6	Power 24 V	Connection of the MDA Vision to the local voltage supply via the supplied power supply unit

Port lock



Fig. 38: Port lock with key

- The service port is mechanically locked with a port lock upon delivery for cyber security reasons.
- The key for removing the port lock is in the bag with the screws.

NOTE! For cyber security reasons, the service port must remain locked.

► Store keys securely and protect them from unauthorized access.

5.2 Connecting the MDA Vision to the voltage supply



Fig. 39: Industrial power supply unit with connecting cables

Legend

- | | |
|---|---|
| 1 | OUTPUT: Connection to MDA Vision |
| 2 | Connecting cable |
| 3 | INPUT: Connection to the local voltage supply |
| 4 | Connecting cable with different power plugs are included in the scope of delivery |

- The MDA Vision is connected to the local voltage supply.
- The connection is made via the industrial power supply unit included in the scope of delivery.
- All components of the MDA Vision are supplied with voltage via the power supply unit.

Establishing connection



Fig. 40: Establishing connection to the voltage supply

- ▶ Connect the **OUTPUT** cable to the power supply unit and plug it into the **Power 24 V** male connector on the MDA Vision.
- ▶ Screw together the plug connection.
- ▶ Connect to the local power supply via the **INPUT** power cable with suitable male connector.

5.3 Connecting the MDA Vision with the user network

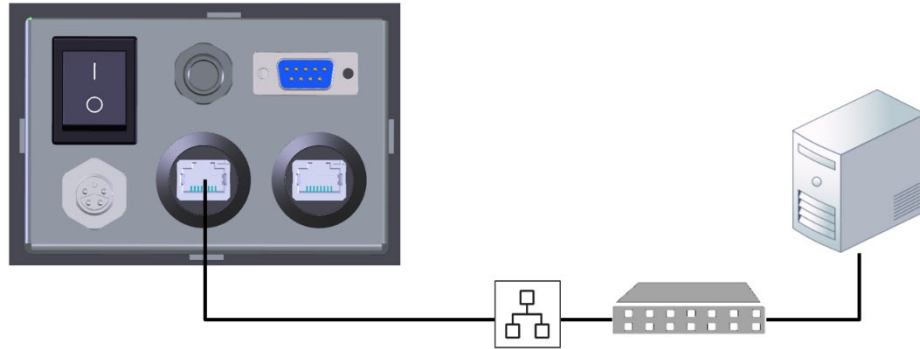


Fig. 41: Connection to user network

Creating a connection

- ▶ Plug the RJ45 male connector of the Ethernet cable on the MDA Vision into the **Data** connection socket.
NOTE! The Ethernet cable is not included in the scope of delivery.
- ▶ Lead the cable to a free Ethernet female connector of the target network.
- ▶ Establish Ethernet connection with the target network.

5.4 Connecting the mobile handheld scanner (optional)

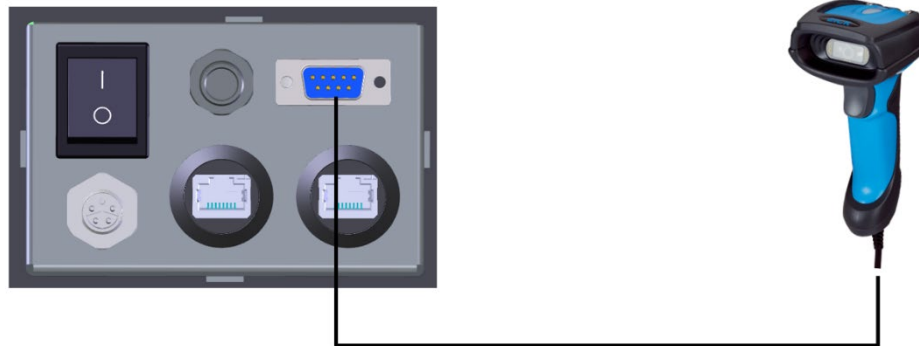


Fig. 42: Connecting the mobile handheld scanner (optional)

- ▶ Plug the plug connector of the cable coming out of the mobile handheld scanner into the **Aux Scanner** serial connection socket.
- ▶ Secure the plug connection using two screws.

5.5 Connecting WLAN module (accessory)

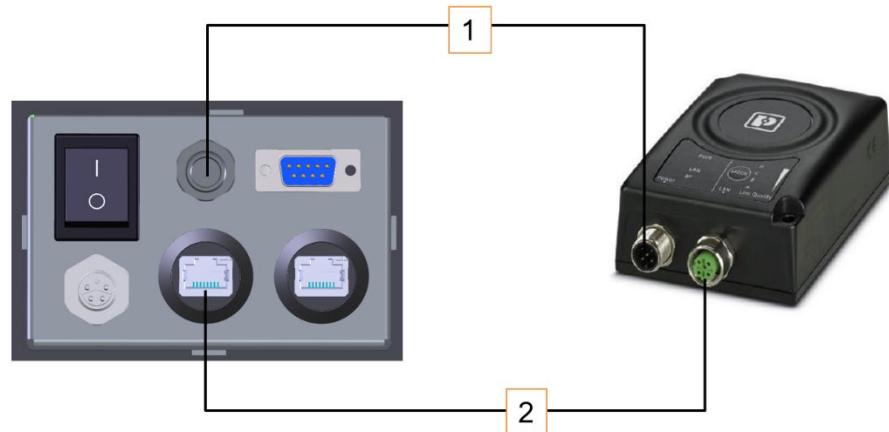


Fig. 43: Connecting WLAN adapter (accessory)

Legend

- | | |
|---|--|
| 1 | Connection to the supply voltage of the MDA Vision |
| 2 | Connection to the data interface |

Creating a connection

- ▶ Screw the supply voltage connecting cable of the WLAN module onto the **Power** male connector.
- ▶ Connect the other end of the cable to the **Aux 24V** connection on the MDA Vision.
- ▶ Screw the Ethernet cable on the WLAN module onto the **LAN** male connector.
- ▶ Plug the other end of the cable on the MDA Vision into the **Data** connection socket.

6 Commissioning

Commissioning may only be performed by qualified persons.

6.1 Switching on the MDA Vision

All components of the MDA Vision are started together.

- ▶ Make sure that there is no object on the scale.
- ▶ Switch on the MDA Vision.

Start process

- All system components of the MDA Vision are booted up and checked for operational readiness in a self-test.
- The start process takes about 30 seconds (without separate camera).
- During the start-up phase, a window with a progress display appears on the touchscreen. This visualizes the progress of the start-up phase.
- After the initial switch-on, the installation wizard appears (see the following section [6.2 Running installation wizard](#)).
- If initial commissioning has taken place, the measurement window is displayed after start-up (see [7.1 Layout of the user interface](#)).

6.2 Running installation wizard

Once all components have booted up, the installation wizard is started on the display. The wizard guides you step by step through the initial settings.

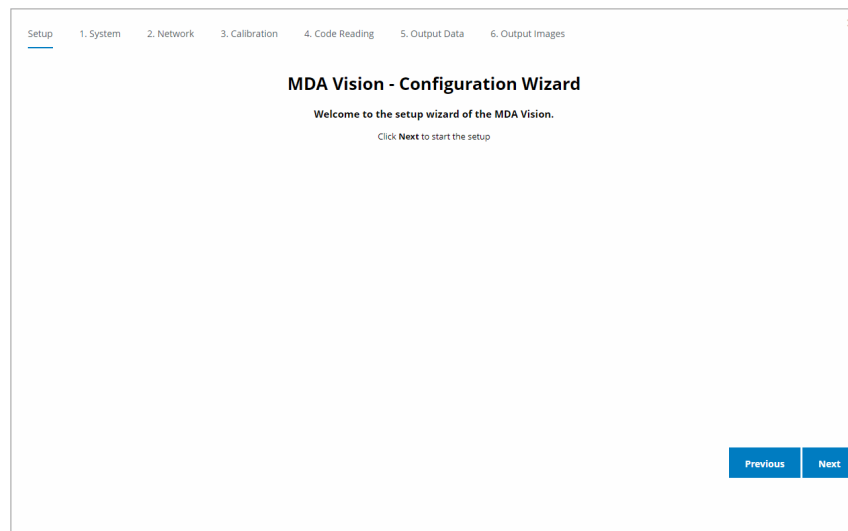


Fig. 44: Installation wizard home page

- ▶ Click **Next** and use **Next** to navigate through each page of the wizard.

6.2.1 Basic system settings

Basic system settings are configured on the **System** page.

Fig. 45: System page

Date and time

- ▶ Under **Date & Time**, enter the current date and current time.
 - All measurement and read data determined by the MDA Vision are then provided with a time stamp based on this setting.

Units of measurement

- ▶ Under **Units**, select units of measurement for the dimension and weight values. The units of measurement defined here for dimensioning and weight determination apply both to the values shown in the measurement window of the display and to the data output.

6.2.2 Configuration of the network settings

The **Network** page is used to integrate the MDA Vision into the user network.

The screenshot shows a web-based configuration interface for the MDA Vision system. At the top, there is a navigation bar with tabs for 'Setup', '1. System', '2. Network', '3. Calibration', '4. Code Reading', '5. Output Data', and '6. Output Images'. Below the navigation bar, there is a heading '2. Network' and a sub-heading 'Enter the following information in order to connect the device to your network. In case of questions please contact your network administrator'. The form contains several input fields: 'System Name' (with 'MDA Vision' entered), 'Use DHCP' (a toggle switch that is currently turned off), 'IP Address' (with '192.168.0.32' entered), 'Gateway' (with '0.0.0.0' entered), 'Subnet mask' (with '255.255.255.0' entered), and 'DNS Server IP' (with '0.0.0.0' entered). There is a blue 'Apply Changes' button at the bottom left and 'Previous' and 'Next' buttons at the bottom right.

Fig. 46: Network page

Name ▶ In the **System Name** field, specify the name under which the MDA Vision is to be displayed in the user network.

NOTE! The name is also output in the data string.

Using static IP address

- ▶ Leave **Use DHCP** option deactivated if a static IP address is to be used.
- ▶ Enter an unused IP address from the address range of the user network and specify the subnet.

Obtaining IP address automatically

- ▶ Activate the **Use DHCP** option if the IP address of the MDA Vision is to be obtained automatically via a DHCP server.
- ▶ The obtained IP address is displayed in the **IP Address** field. The input fields for the IP address are grayed out and blocked for input.

Adding IP address if necessary

- ▶ If necessary, add the IP address of the gateway if a connection is to be established outside the target network.
- ▶ Specify the IP address of the DNS server if the data is transmitted to a domain. The DNS server (DNS = Dynamic Name Service) is responsible for assigning the domain name to the IP address.

6.2.3 Calibration of the components

On the **Calibration** page, the components of the MDA Vision are calibrated and adapted to the specific situation on site.

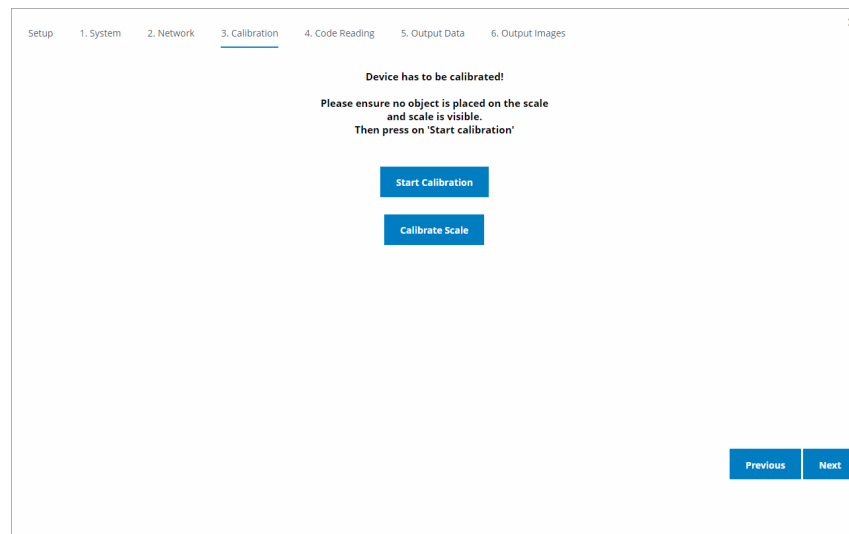


Fig. 47: Calibration page

Calibration of the sensor components for dimensioning

- Click on **Start calibration**. The current height reference of the Visionary-S 3D camera is determined.

Before starting the calibration, a note appears stating that the calibration requires a free measuring range.

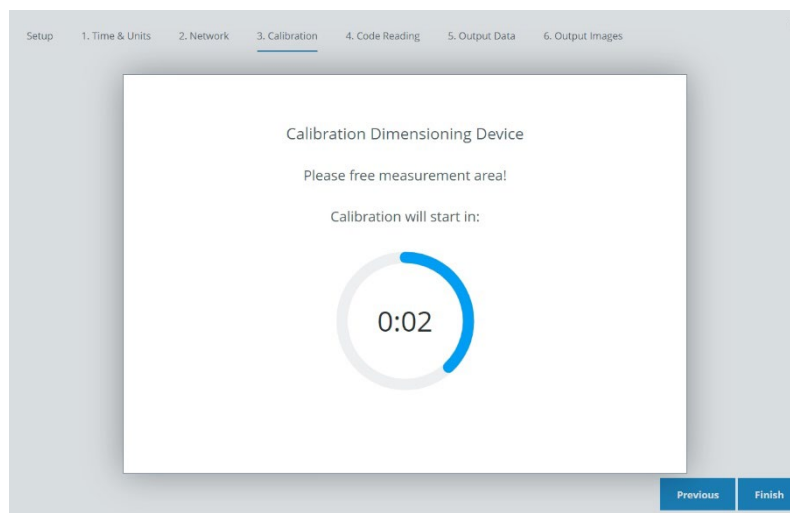


Fig. 48: Calibration

- ▶ If necessary, remove all objects from the scale and do not block the view of the 3D camera during calibration.
- ▶ Calibration starts automatically after 5 s.

A window informs about the successful completion of the calibration.

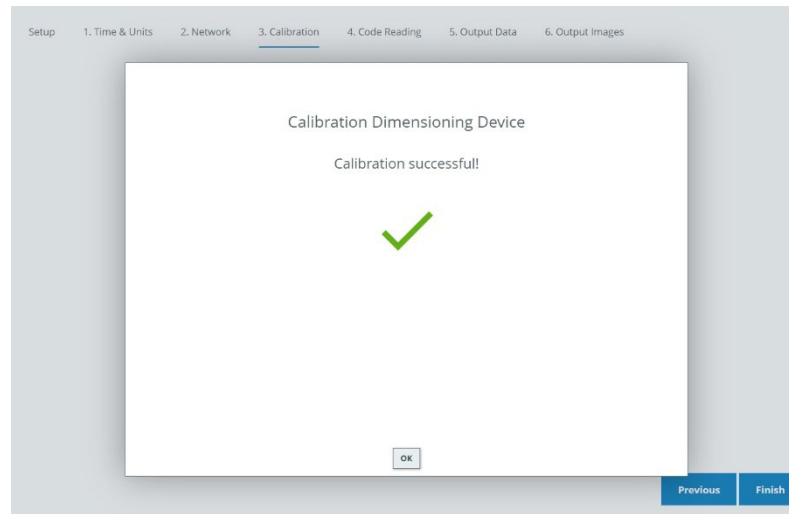


Fig. 49: Calibration successful

NOTE! The focus setting for the Lector6xx image-based code reader is already set at the factory. The color camera is also already set up at the factory.

Enter GEO code in scale display

- ▶ Confirm successful calibration of the 3D camera with **OK**. Click on **Calibrate scale**. The window for calibrating the scale is displayed.

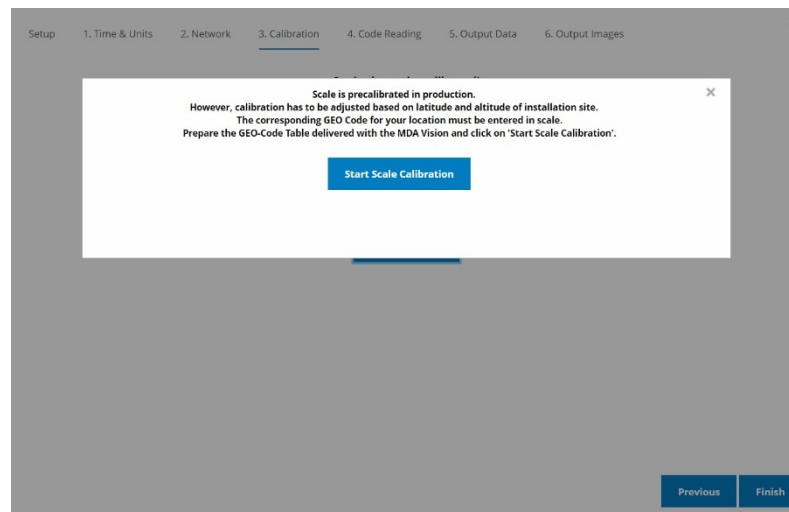


Fig. 50: Start Scale Calibration

- ▶ Click on **Start Scale calibration**. You will receive appropriate instructions for entering the GEO code in the scale display.

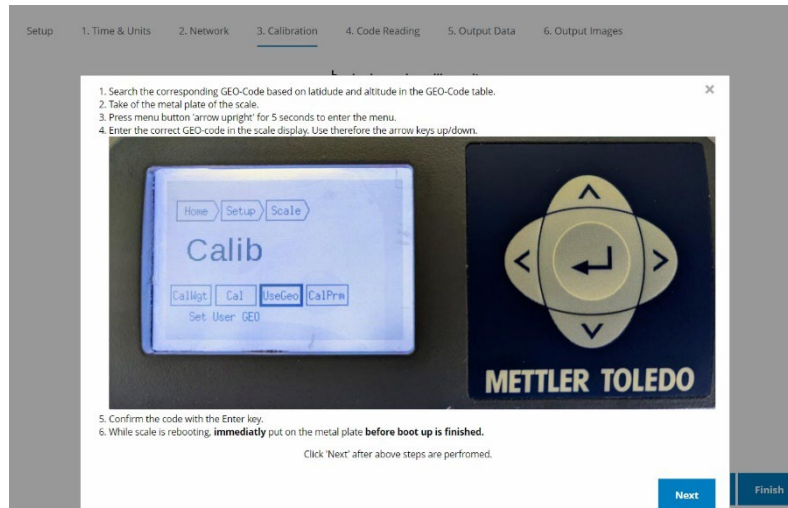


Fig. 51: Calibration of the scale

- ▶ Remove the plate from the scale. The scale display is now accessible.

After the first power-up, the scale display automatically prompts for the GEO code.

NOTE! Entering the geo code compensates for the difference in gravity between the factory location (where the scale was calibrated) and the installation location of the scale.



Fig. 52: Scale display

- ▶ Press the ◀ or ▶ arrow keys to scroll through the code numbers. The numbers repeat themselves.

The appendix contains a list of all regions and the corresponding GEO codes (see section [12 GEO codes](#)).

- ▶ Press ENTER pushbutton to accept the selection.

The scale is restarted and displays 0.00.

- ▶ After input, immediately replace the sheet metal cover so that the correct zero weight can be determined.

Completion of calibration

- ▶ Confirm entry of the GEO code with **Next**.
 - The scale is now set up.
 - A message window informs about successful completion of the calibration.

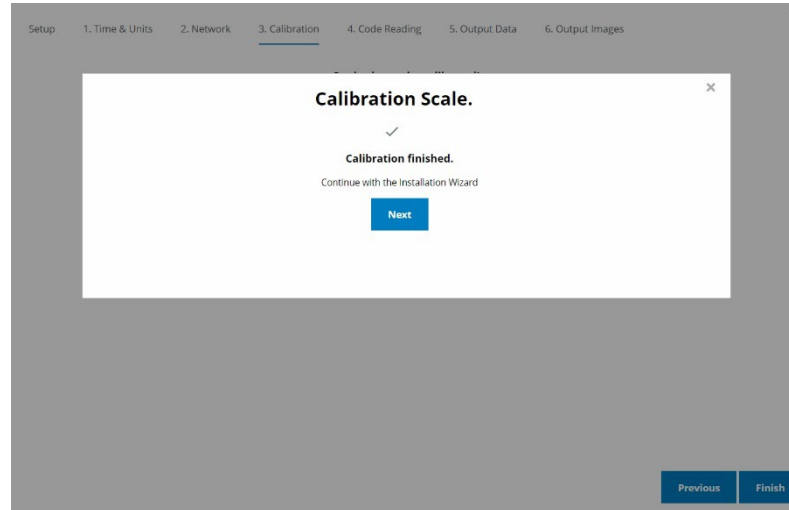


Fig. 53: Calibration Scale

► Confirm the message with **Next** and continue with the installation wizard.

6.2.4 Code reading configuration

The **Code reading** page is used to select the source of code reading and the code types to be decoded.

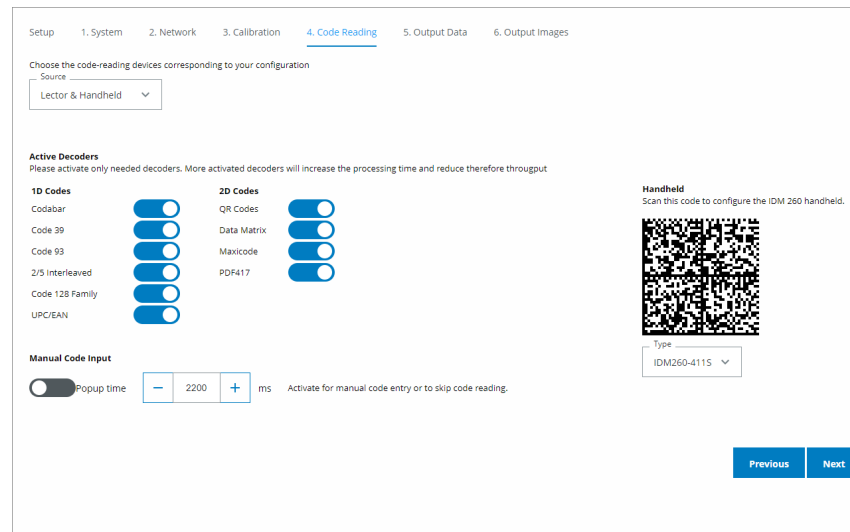


Fig. 54: Code Reading page

Selecting the scanner

- In the **Source** field, select the reader being used.
 - **Lector:** Only a Lector6xx camera reader is used for code reading.
 - **Lector & handheld:** A connected mobile handheld scanner can optionally be used for manual code acquisition.
 - **Handheld scanner:** The code acquisition can only be performed with a connected mobile handheld scanner.
 - **No Code Reading:** Allows measurement without code reading.

Setting code type(s)

- ▶ In the **Active Decoders** area, select all code types that are to be decoded in principle.
- Specifying multiple active decoders will slow down the read process.

Configuring the mobile handheld scanner

If a mobile handheld scanner is connected, a configuration code (2D) is displayed on the right-hand side.

- ▶ Under **Type**, select the connected mobile handheld scanner for displaying the correct code.
- ▶ To activate the scanner, read the displayed code using the mobile handheld scanner.

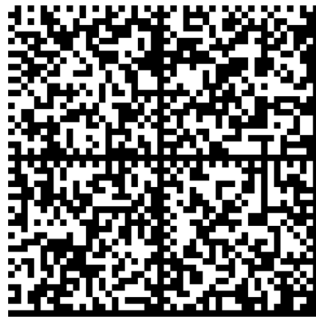
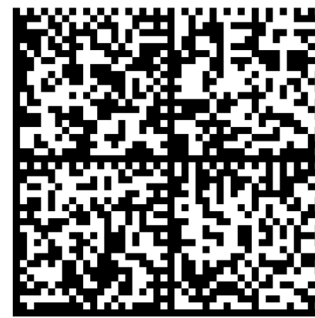


Fig. 55: IDM260-311 QR code



IDM260-411 QR code

6.2.5 Configuration of the data output

The **Output Data** page is used to configure TCP/IP or FTP data transmission. The MDA Vision can be configured as a TCP/IP server or client. Alternatively, the results can be transmitted to a server via FTP client.

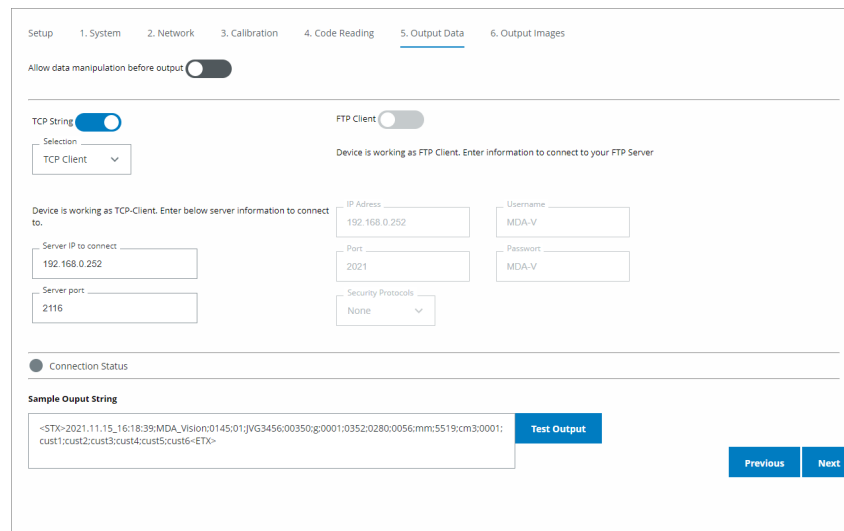


Fig. 56: Output Data page

Configuring MDA Vision as TCP/IP client

The measurement results are retrieved from an external TCP/IP server.

- **Device IP:** IP address of the MDA Vision. The MDA Vision is addressed from the external server via this IP address.
- **Client port:** Port through which an external server communicates with the MDA Vision.

Configuring MDA Vision as TCP/IP server

The measurement results are transmitted from the MDA Vision to an external TCP/IP client.

- **Server IP to connect:** IP address of the client to which the MDA Vision must connect.
- **Server port:** Port through which the MDA Vision communicates with the client.

FTP output

- The MDA Vision can alternatively be configured as an FTP client.
- The file name and the file extension are fixed (see the *Customer Interface Description* supplement).

NOTE! Either TCP/IP OR FTP data transmission is possible. Both transmission types cannot be set up in parallel.

Testing data output

► Tap **Test output**.

The sample data string is output via the selected interface.

This can be used to check whether the MDA Vision can establish a connection and whether a result arrives in the user system.

Safe communication

- Depending on the application, personal data can be processed with the MDA Vision. In this case, a secure communication protocol must be selected.

6.2.6 Image output configuration

The **Output Images** page is used to configure the output of the image files.

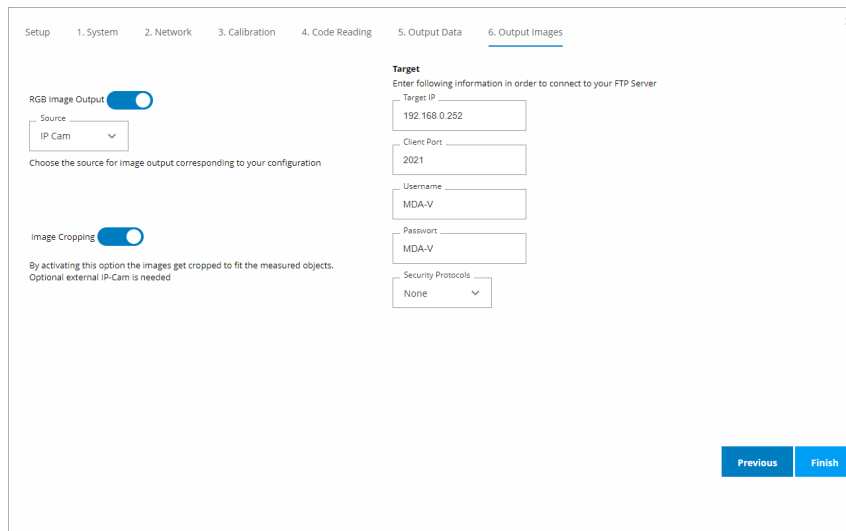


Fig. 57: Output Images page

Output of camera image

- Activate output of the camera image. To do this, set the **RGB image output** switch.
- In the **Source** field, specify which device should provide the camera images. As a rule, this is the **Visionary-S** 3D camera.
- Activate **Image Cropping** if the camera image is to be cropped to the image section with the measured object.

NOTE! This is only possible if the entry **IP Cam** was selected in the **Source** field.

- Configure MDA Vision as FTP client for image output (for settings see section [6.2.5 Configuration of the data output](#)).

**Safe
communication**

- Depending on the application, personal data can be processed with the MDA Vision. In this case, a secure communication protocol must be selected.

6.2.7 Completing initial commissioning

► Click **Finish**.

The installation wizard is closed automatically and the measurement window is displayed.

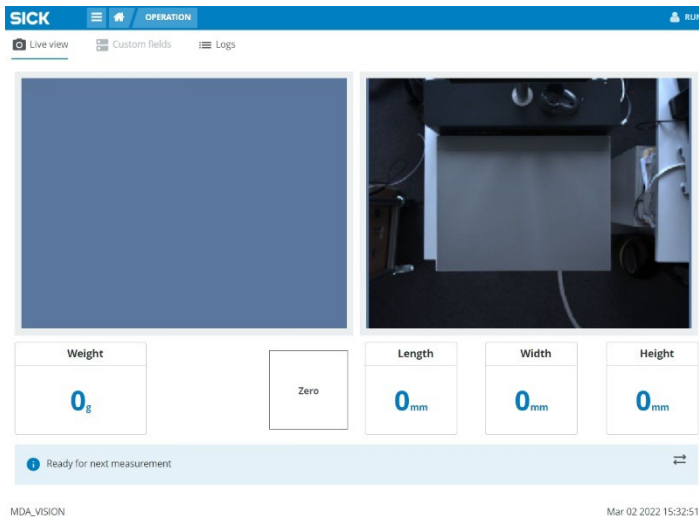


Fig. 58: Measurement window

7 Operation

7.1 Layout of the user interface

After switching on or after running through the wizard for initial commissioning, the measurement window is displayed in the **Live View** tab. Registration is not required.

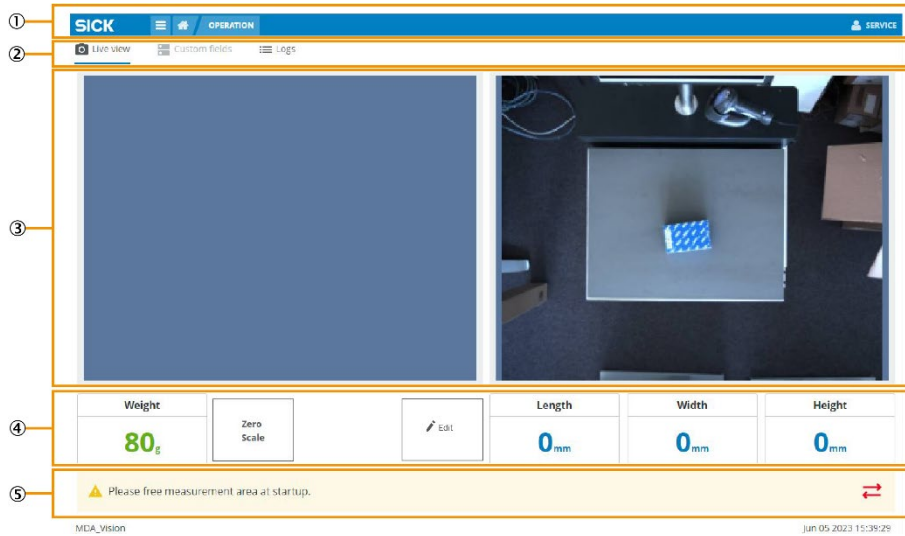


Fig. 59: Structure of the user interface

Legend

- 1 Menu bar
- 2 Navigation bar
- 3 Image area
- 4 Result line
- 5 Status bar

Menu bar

The menu bar contains the following icons:

	Allows switching to the configuration area.
	Switches back to the measurement window.
	Displays the currently selected working range, here Operation .
	Displays the current user level.
	Allows changing of the user level.

Navigation bar

The navigation bar allows you to switch between the individual working ranges.

Live view	Live display of the measurement with result display.
Custom fields	Addition of user-defined information to the measurement.
Logs	List with the last measurement results

Image area

- The image area contains two windows.
- The left window shows the image of the Lector6xx code reader with the decoded code information, the right window contains an image of the Visionary-S 3D snapshot camera of the current measuring station.

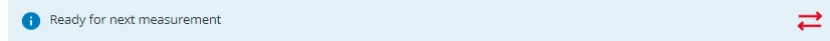
Result line

- The result line contains fields for displaying the determined weight and dimension values.
- **Zero** allows the electronic scale to be manually set to zero weight value.
- **Edit** allows the measured values to be manually adjusted, see section [7.2.4 Manual measurement data manipulation](#).

Status bar

- The status bar contains information on the system status, the current measurement status and the connection status.
- The display is made by colored symbols as well as a short note text.
- A blue symbol with the *Ready for next measurement* note indicates readiness for operation. The first measurement can be started.
- An existing connection to the user system is visualized by a green double arrow on the right side of the status bar.

If there is no connection, the double arrow is red.



An overview of all messages is provided in the appendix in section [10. Notes and status messages](#).

7.2 Performing measurements

7.2.1 Starting measurement

- ▶ Bring the object into view of the 3D snapshot camera.

NOTE! Only ever insert **one object**.

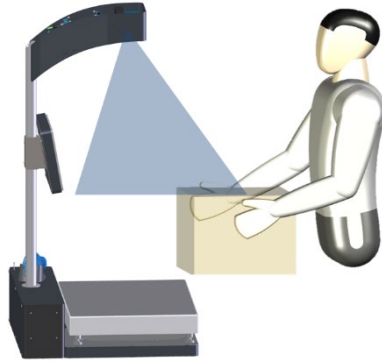


Fig. 60: Inserting object

Display

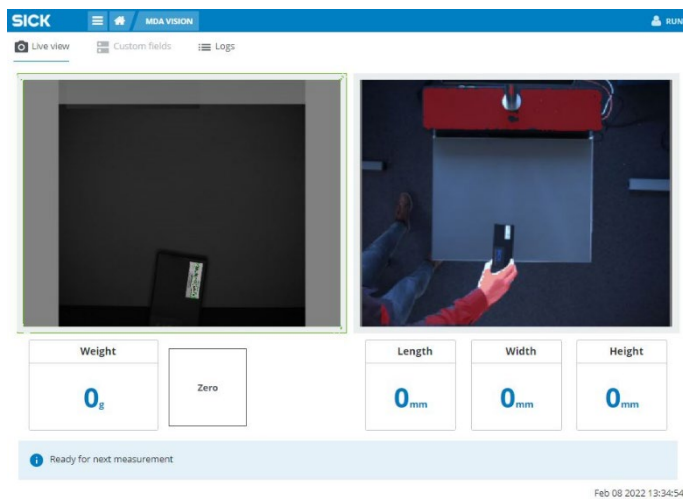


Fig. 61: Inserting object

- As soon as the Visionary-S registers a change in the field of view, the image-based code reader is activated.
- LED illumination and aiming laser are switched on.
- The measuring object becomes visible in the two windows.

7.2.2 Automatic code reading

- ▶ Hold object so that the code can be read.
- ▶ Hold flat and small objects in the reading field at a small distance from the Lector6xx.
 - The red laser dots (or the red laser cross) visible on the object make it easier to align the object for successful code reading.

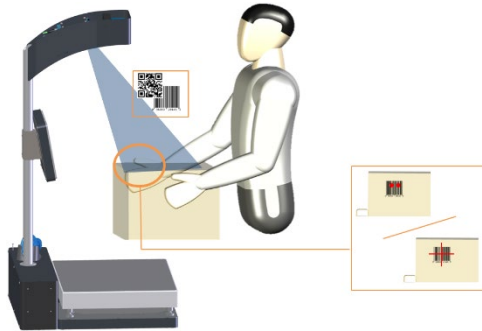


Fig. 62: Automatic code reading

Display

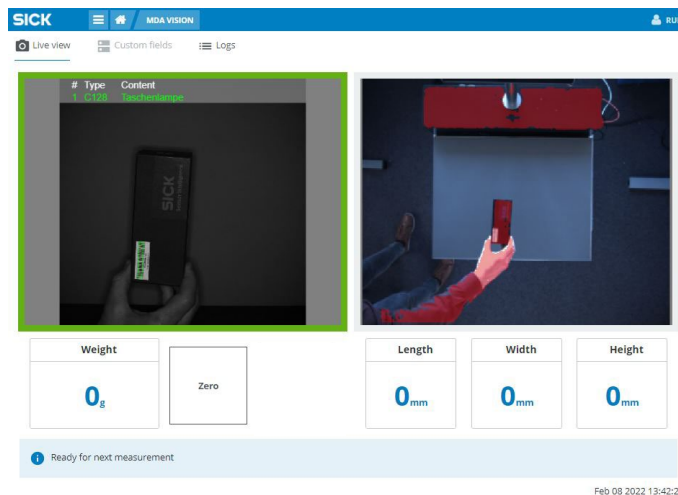


Fig. 63: Automatic code reading

- As a rule, the code is already read when the object is inserted. The left image display contains the camera image of the Lector6xx with the codes, the right continues to display the current measurement situation.
- The red/yellow coloring of the object and hand visualizes that the prerequisites for weight and dimension determination have not yet been met.

Successful code reading is visualized as follows:

- The left image display with the codes is outlined in **green**.
- The read code is also outlined in **green** in the camera image.
- The read code information is displayed above the camera image.

The Lector6xx is then deactivated again. The illumination and aiming laser are switched off.

NOTE! If the mobile handheld scanner is connected, the code can always be read with it as an alternative to the Lector. After successful code reading, the Lector is deactivated again. The read code appears in the display (see section [7.3 Using the mobile handheld scanner](#)).

7.2.3 Measurement value determination and data output

- ▶ After successful code reading, place the object in the **center** of the scale so the center of gravity of the object is over the scale.
- Object overhang is tolerated as long as the object is completely within the field of view of the Visionary-S 3D camera and the object is dimensionally stable.
- ▶ Release the object and remove your hands from the measuring field.

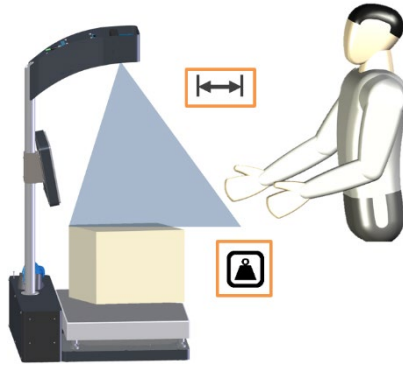


Fig. 64: Automatic determination of measured values

Display

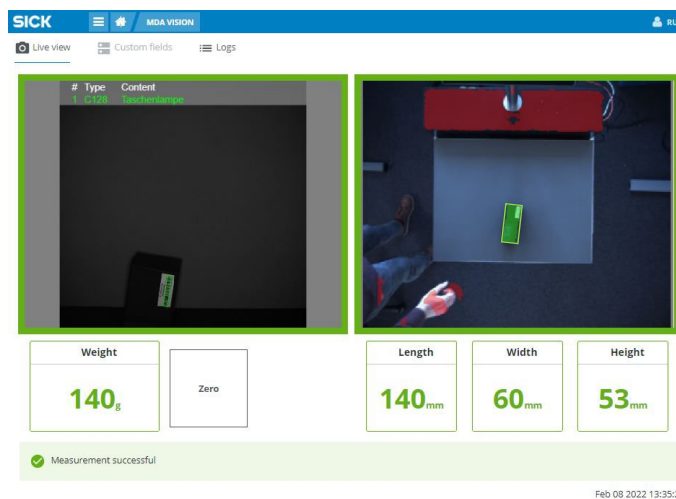


Fig. 65: Measured value determination and data output

- As soon as the object is free on the scale, weight and dimension values are determined and displayed.

A successful determination of weight and measurement is visualized as follows:

- The measuring station display is outlined in green after the measured value has been successfully determined.
- The measured object is displayed in green.

Everything that is not assigned to the measuring object is colored red in the measuring station display (e.g. arms and hands).

- Measurement and read data are output immediately (or after removal of the object if manual measurement data manipulation is activated) if a network connection exists.

Readjusting object

- ▶ If the code was not detected, move the object on the scale until the code can be determined by the code reader or determine the code using the mobile handheld scanner.

7.2.4 Manual measurement data manipulation (optional)

Manual measurement data manipulation may be required if objects are measured for which the following apply.

- Size outside the measuring range
- Weight outside the measuring range

In this case, the data can be entered manually for further processing.

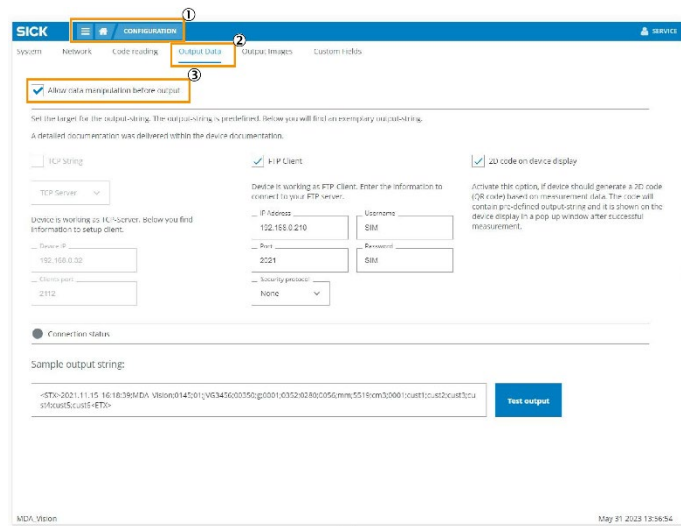


Fig. 66: Selecting manual measurement data manipulation

► In the **Configuration** menu, select the **Output Data** tab and tick the **Allow data manipulation before output** option.

- An additional **Edit** button appears on the main screen (**Live View**).

► Selecting **Edit** brings up a pop-up menu:

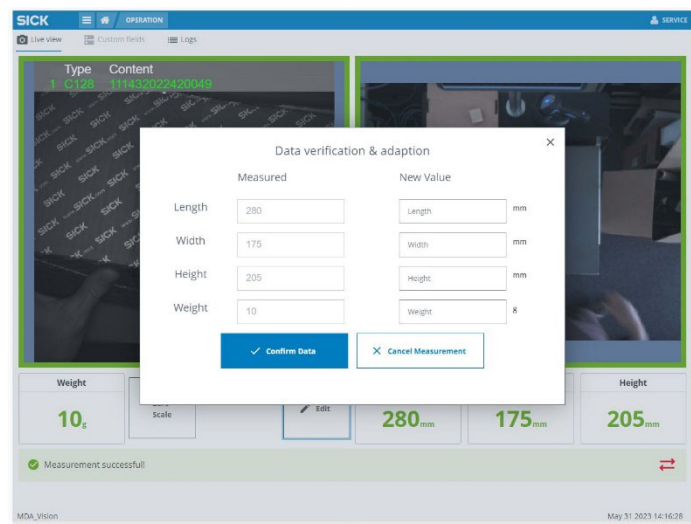


Fig. 67: Manual measurement data manipulation

► Manually enter the values in the fields under **New Value**.

- If a field is left empty, the previously measured value is accepted.
- Contrary to the standard process, with this method the measurement result is sent after removal of the object from the scale rather than immediately after measurement.

7.2.5 Completing measurement

- ▶ Remove the object from the scale.



Fig. 68: Removing the object from the scale

Display

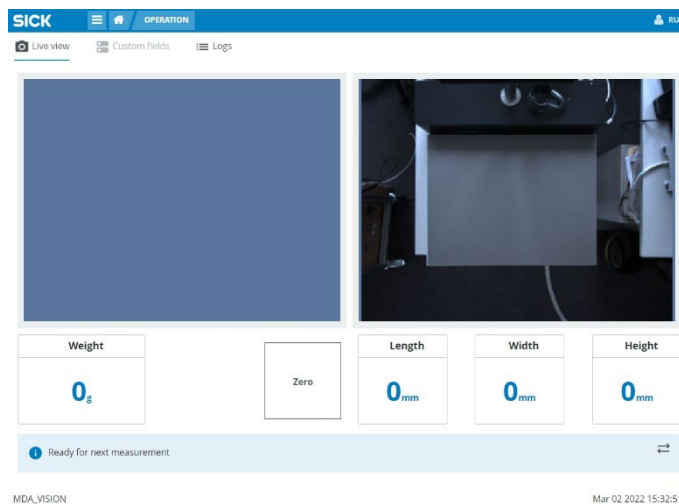


Fig. 69: Measurement window

- ▶ All measured values are reset to zero.
 - The left image display is empty.
 - The measuring station display provides an up-to-date live image.
 - The *Ready for next measurement* note appears in the status bar.

Starting next measurement

- ▶ Start the new measurement process. To do this, place the object in the viewing range of the Visionary-S (see section [7.2.1 Starting measurement](#)).

7.3 Using the mobile handheld scanner

As an alternative to automated code reading by the Lector, the mobile handheld scanner can also be used to acquire codes.

This procedure is useful, for example, if the object has a very small code or the code is located on the side or bottom of the object. Even objects without a printed code can be detected by scanning a separate label.

- ▶ Place the object on the scale.
- ▶ Remove the mobile handheld scanner from its holder.
- ▶ Press the trigger on the scanner handle to activate the scanner light source.



Fig. 70: Scanning a code using the mobile handheld scanner

- ▶ Aim the laser beam at the code. A beep indicates that the code has been read successfully.
- ▶ Put the scanner back into the bracket.
 - The manually entered code is shown with the last visible camera image in the left image window.

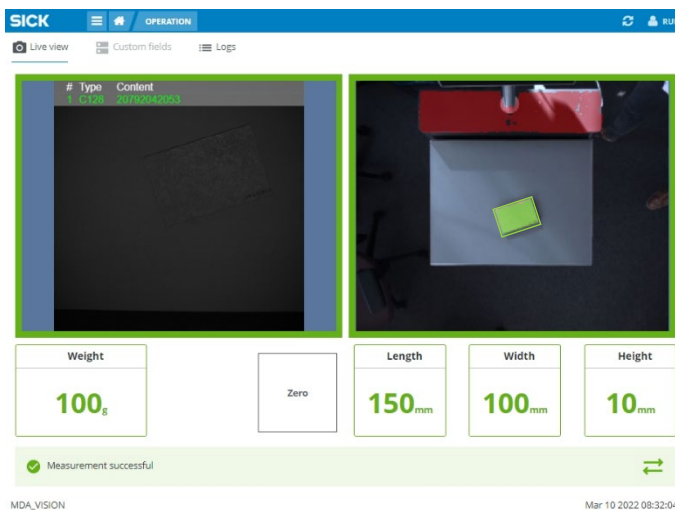


Fig. 71: Manually entered the code in the measurement window

- As soon as the object is standing freely on the scale, the weight and dimension values are determined, displayed and output if there is a network connection.

7.4 Manually entering the code or skipping code reading

It is possible to enter a code manually via a pop-up window after a defined timeout or to skip the code entry.

The option must be activated in the configuration menu (see section [8.2.3 Code reading settings](#)).

Entering code

- ▶ Bring the object into the viewing range of the Lector.
- ▶ If there is no successful code reading in the set time period, the pop-up window opens.

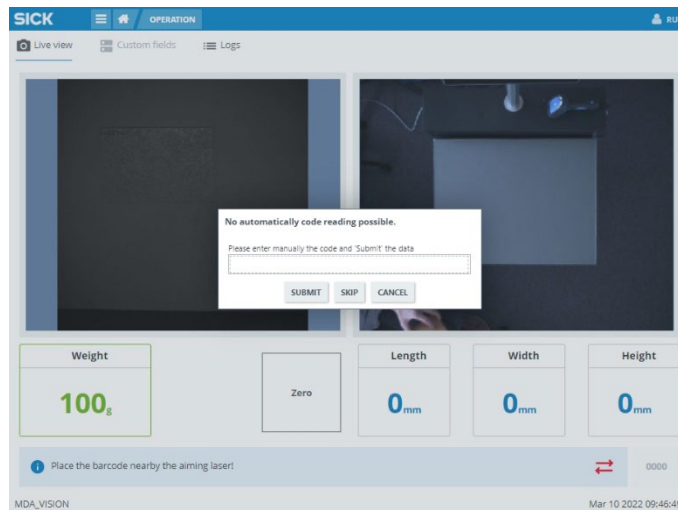


Fig. 72: Manual code entry

- ▶ Enter the code manually into the field using the keyboard that appears.
- ▶ Confirm with **SUBMIT**. The pop-up window will close.
 - The manually entered code is shown without the camera image in the left image window.

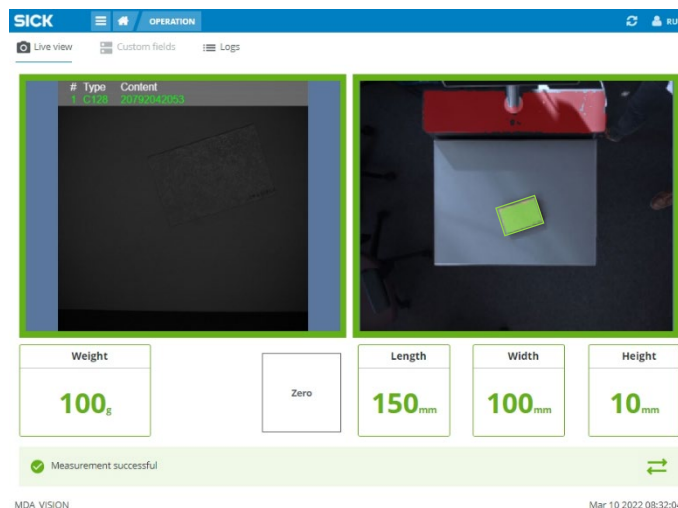


Fig. 73: Measurement window

NOTE! As an alternative to manual code entry in the pop-up window, the mobile handheld scanner can also be used. If the code is acquired via the mobile handheld scanner and not typed in, the pop-up window closes automatically after successful code reading by the mobile handheld scanner.

Skipping code entry

- ▶ Skip the entry of a code with **SKIP** (e.g. if no code is available and it is to be added later in the user system and assigned to the data record).
 - The pop-up window will close.
 - No bar code is shown. Weight and dimension values are determined.

7.5 Perform measurement with additional information (“custom fields”)

- Additional fields (so-called custom fields) allow the master data record to be supplemented with custom information, such as information about the measurement staff, the measurement location, or company-specific object information.
- The input takes place immediately after the measured value determination is completed.
- Data output only occurs after the additional information has been entered.
- The acquired custom data is transmitted to the user system together with the object master data after the measurement.

Getting started

If additional fields have been configured, the change to the **Custom Fields** tab takes place immediately after the measurement value determination has been completed. The defined additional fields are either empty or they contain the entries made before the last measurement.

The screenshot shows the SICK MDA_VISION interface. At the top, there is a blue header with the SICK logo and the word 'OPERATION'. Below the header, there is a navigation bar with three items: 'Live view', 'Custom fields' (which is highlighted), and 'Logs'. The main content area contains three custom fields: 'Packaging unit' with a text input field containing the number '0', 'Dangerous good (HAZMAT)' with two buttons labeled 'YES' and 'NO', and 'Fragile' with two buttons labeled 'YES' and 'NO'. At the bottom center, there is a blue 'Confirm' button. The footer of the interface shows 'MDA_VISION' on the left and 'Mar 02 2022 15:32:51' on the right.

Fig. 74: Custom fields

For configuration of the additional fields, see section [8.2.6 Defining custom additional fields](#).

Field types

There are three types of additional fields:

- **Text fields** enable the input of alphanumeric characters. Tap in the field to enter. A keyboard is displayed.
- Only numbers can be entered in **numeric fields**. The input is made via the displayed keyboard here as well.
- Manual input is not possible in **selection list fields**. A predefined list entry must be selected.

Process

- Check existing entries and change if necessary.
- Fields marked with an asterisk are required. It is mandatory to make an entry here.
- Confirm input with **Confirm**.

NOTE! The button is not active until all mandatory fields have been filled in.

- The switch back to the **Live View** takes place.
- The measurement results are automatically transmitted to the user system together with the additional information in a data record.

Next steps

- ▶ Remove object from scale.
- ▶ Start new measurement.

7.6 Measuring objects

7.6.1 Important notes

General rule:
Center placement

- ▶ Always position objects in the center of the scale; only then can irregular objects be measured.

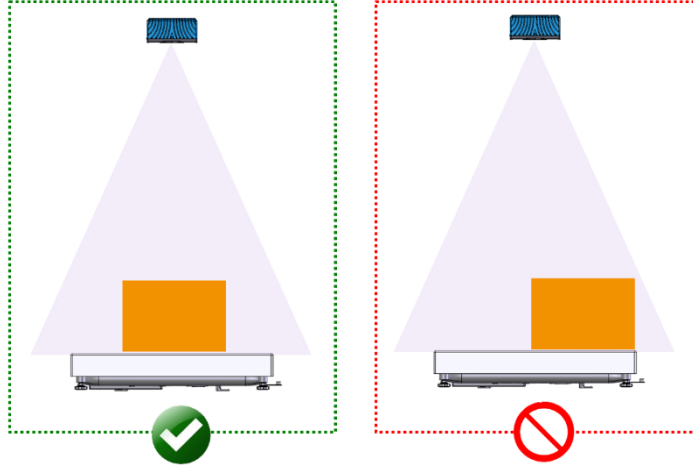


Fig. 75: Center placement of the object

No interruptions during the measurement process

- ▶ Avoid interruptions (e.g. by hand) during the measurement process in order not to falsify the measurement results.

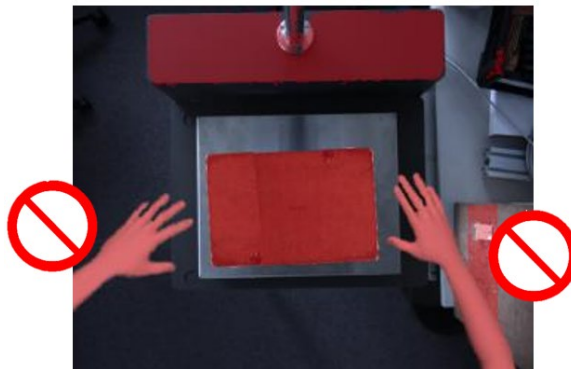


Fig. 76: No interruptions during the measurement process

Free space on both sides of the scale

- ▶ Ensure a clearance of at least 200 mm on both sides of the scale.
- ▶ Do not place any objects there to avoid influencing the measurement.



Fig. 77: Clearance on both sides of the scale

Avoid direct sunlight

- ▶ Avoid direct sunlight on the scale so as not to influence the measurement results.

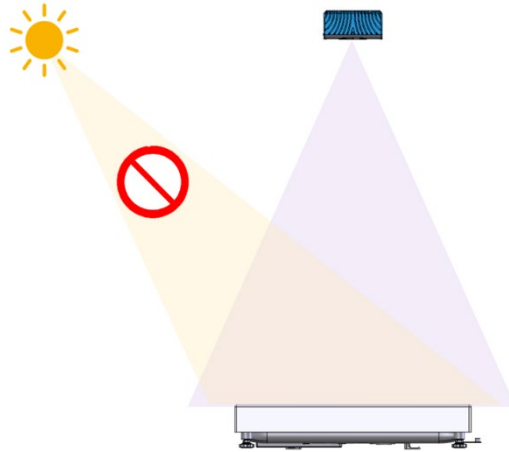


Fig. 78: Avoid direct sunlight

Uniform ambient light

- Uniform ambient light is required for good image color quality.

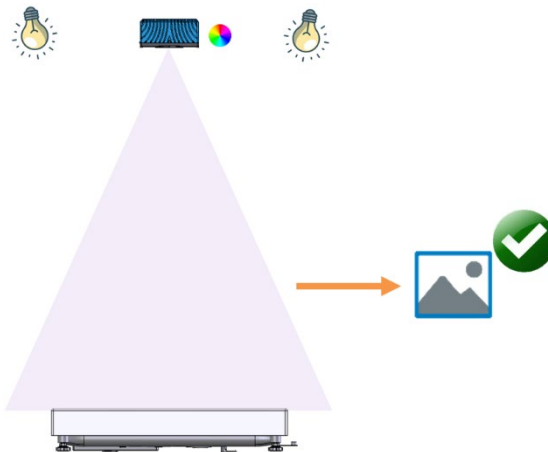


Fig. 79: Uniform ambient light for good color quality

7.6.2 Measuring non-cubic objects

- In principle, non-cubic objects can also be measured with the MDA Vision.
- The accuracy to be achieved depends on the object shape and the object surface as well as the resulting shading.
- The following examples show how acceptable results can be obtained when measuring non-cubic objects. The accuracy values specified in the technical data are not valid in these cases.

Avoid shading

- ▶ When measuring non-cubic objects, make sure that no object edges are shaded. Edges that cannot be acquired due to shading are not taken into account in the contour detection and are not included in the dimension calculation.

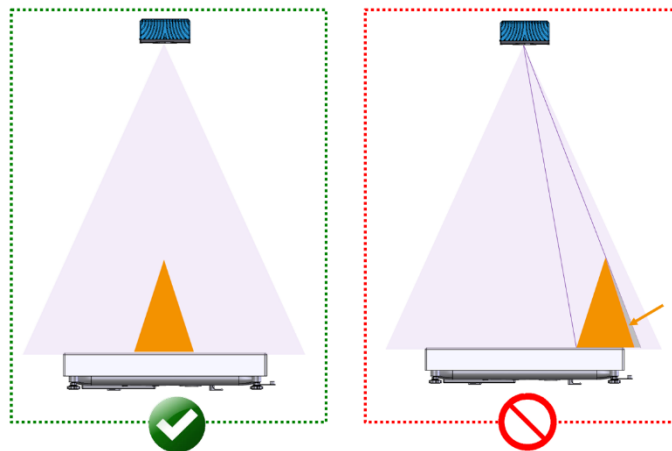


Fig. 80: Avoid shading

Object with small irregularities

- ▶ Place objects with an irregular surface on the scale so that the smallest part faces up. Otherwise, there is a risk that this part will be disregarded due to shading.

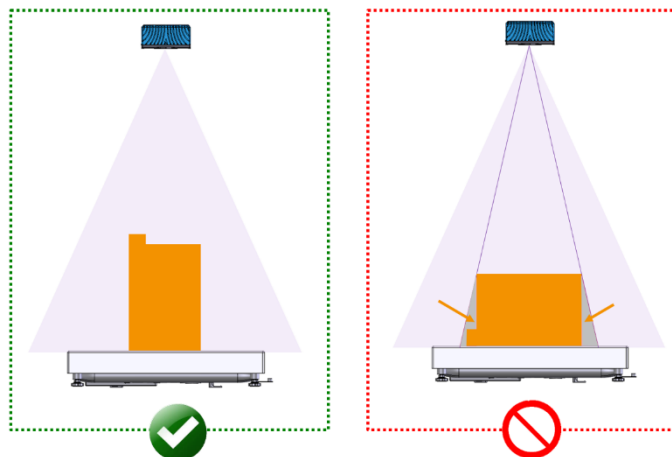


Fig. 81: Placement of multi-part objects

Non-angular transitions to the footprint

- Smooth, non-angular transitions to the footprint can lead to an inaccurate separation of object and background.

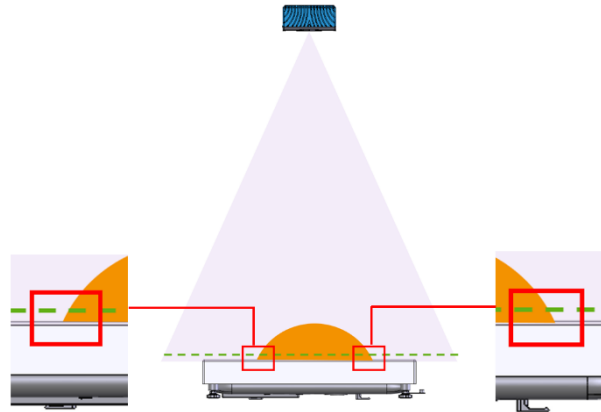


Fig. 82: Non-angular transitions to the footprint

**Object parts
lower than object
minimum height**

- If parts of non-cubic objects are lower than the allowed minimum object height, these parts are not considered in the dimensional measurement.
- The measured object in this case is smaller than the real object.

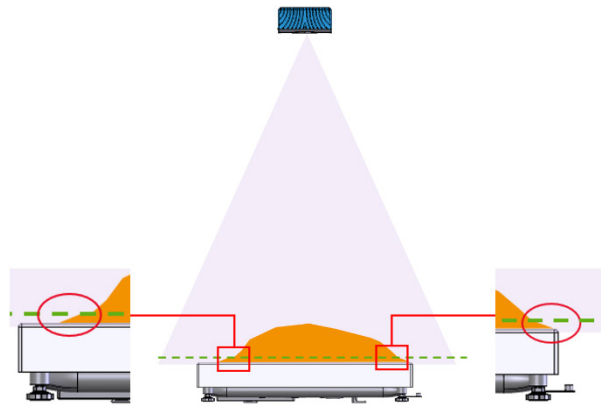


Fig. 83: Object parts lower than object minimum height

7.7 Error situations during measurement

7.7.1 No free measuring range after system start

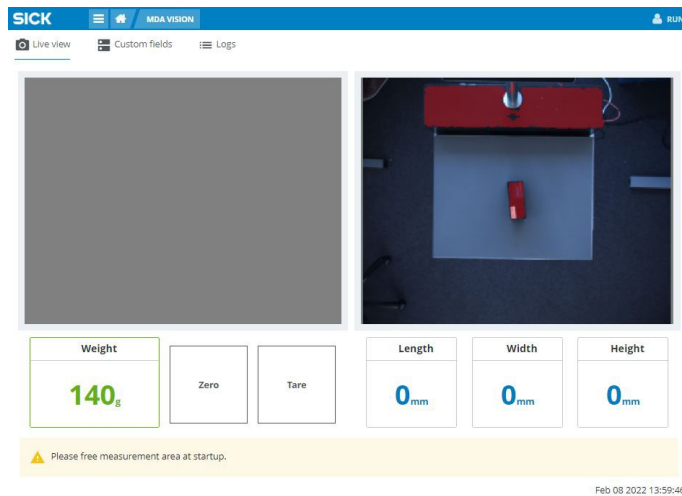


Fig. 84: Measurement window

Error description

- The system was started up with an object on the scale.
- A weight value is displayed after start-up.
- The *Please free measurement area at startup* note appears in the status bar.

Fault cause

- The scale surface must be empty when the MDA Vision is started up, as this is the reference for height determination.

Solution

- ▶ Remove the object from the scale.
 - The *Ready for next measurement* note appears in the status bar.
 - The MDA Vision is now ready for operation.

7.7.2 No code reading

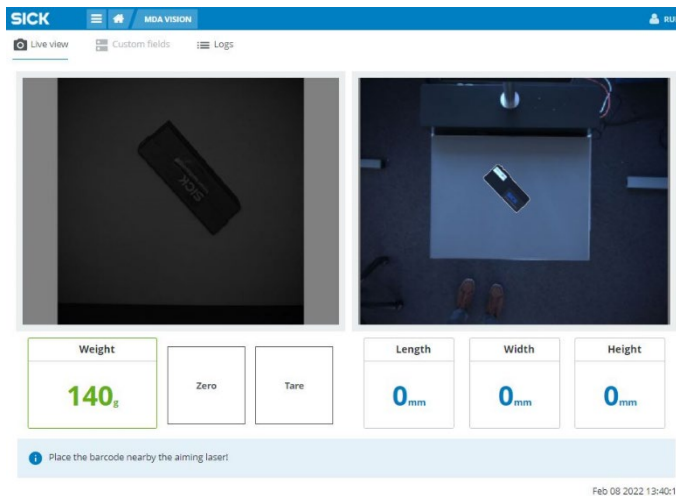


Fig. 85: Measurement window

Error description

- The object was brought into the field of view of the sensors and placed on the scale.
- The weight value is displayed. However, the Lector6xx could not determine a code.
- The *Place the Code nearby the aiming Laser* note appears in the status line.

Fault cause

- The code type has not been activated.
- The code is too small.
- This can happen especially with flat and small objects.

Solution

- ▶ Remove the object from the scale again. This starts a new measurement process.
- ▶ Hold the object in the reading field at a small distance from the Lector.
The red laser dots (or the red laser cross) visible on the object make it easier to align the object for successful code reading.
 - As soon as the code could be read, it is displayed in the Lector window.
 - After setting down on the scale, the measured values are then determined.
 - Check if the code type is activated in the configuration area in the **Code Reading** tab.
 - Or manually enter the code. See Section [7.4 Manually entering the code or skipping code reading](#)

7.7.3 Object not placed in the reading field

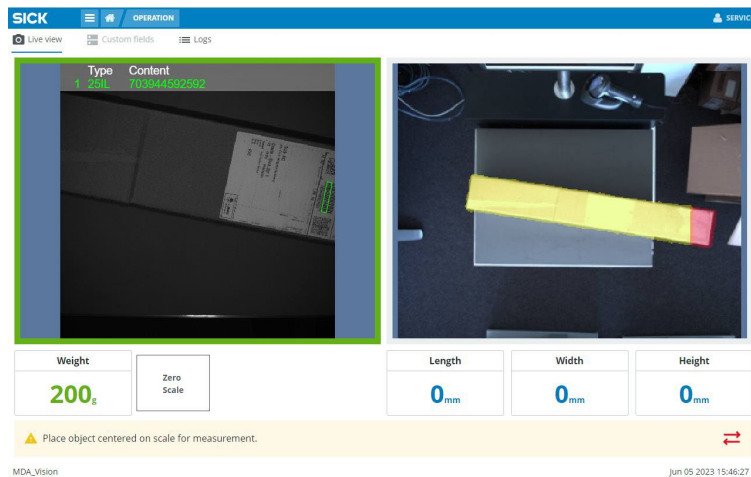


Fig. 86: Object not placed in the reading field

Error description

- Measured value determination is not started despite successful code reading.
- The object is not in the measuring range or touches the edge of the measuring field.
- The *Place object centered on scale for measurement* note appears in the status bar.

Fault cause

- Parts of the object are not in the field of view of the Visionary-S 3D camera.
- Dimensional values cannot be determined.
- Object is too large.

Solution

- ▶ Move the object on the scale so that all object areas are in the Visionary-S field of view.
 - As soon as the identified object has been correctly placed on the scale, weight and dimension values are determined and transmitted if a network connection is established.

7.7.4 Object is too small

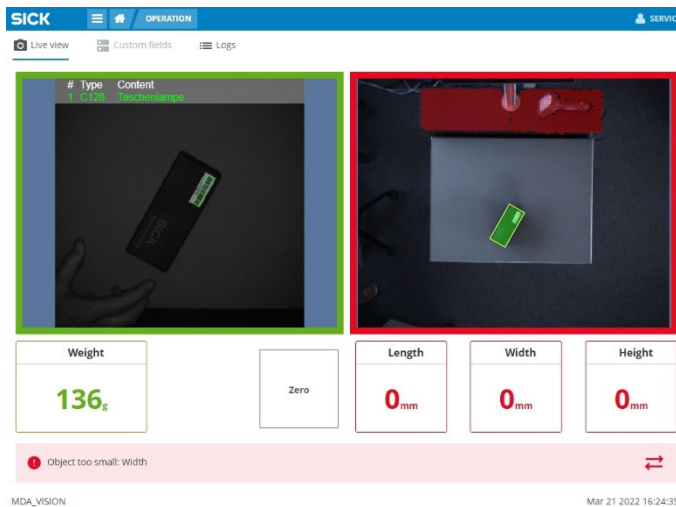


Fig. 87: Object too small

Error description

- No dimensional values are determined.
- The *Object too small* message appears in the status line with a note indicating which dimension does not correspond to the permissible dimensions.
- In the figure above, the object width is smaller than the minimum width allowed.

Fault cause

- One or more object dimensions fall below the permissible dimensions.
- The object is too small.

Solution

- ▶ Only measure objects whose dimensions correspond to the technical data.

7.7.5 Custom Fields were not confirmed

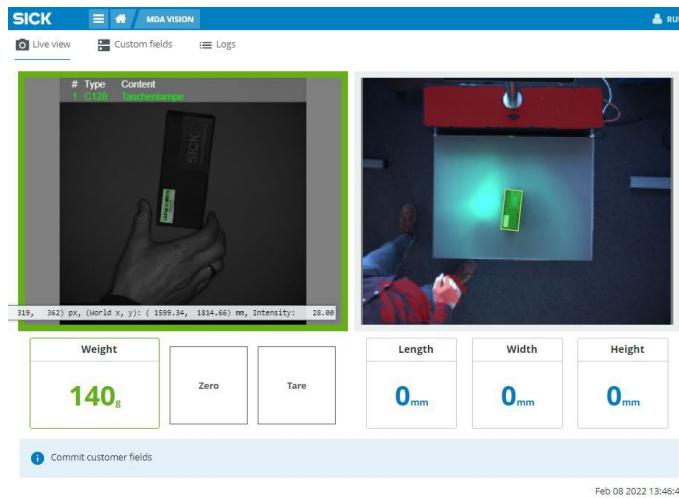


Fig. 88: Commit custom fields

Error description

- The dimension values are displayed.
- The *Commit custom fields* note appears in the status bar.

Fault cause

- The measurement requires the input of additional information.
- This was entered in the **Custom Fields** tab, but not confirmed.

Solution

- ▶ Switch to the **Custom Fields** tab.
- ▶ Tap the **Confirm** button.
 - The program automatically switches to the **Live View** tab.
 - In the status bar, the *Measurement successful* note appears.

7.7.6 No stable object weight

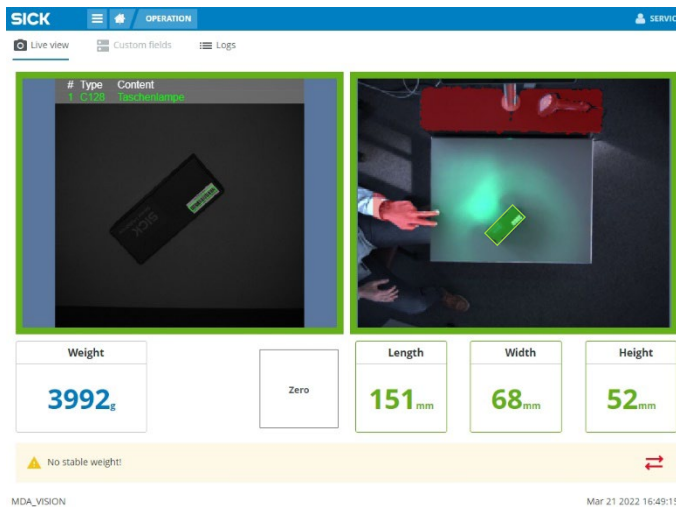


Fig. 89: No stable weight

Error description

- After the code has been read, the weight is displayed, but the value fluctuates.
- As a result, dimension values can be determined, but no weight is displayed.

Fault cause

- The weight value is > 0 , but no stable weight could be determined within 5 seconds.
- Vibration in the working environment.
- Draft in the immediate vicinity.

Solution

- ▶ Remove the object from the scale.
This initiates a new measurement process.
- ▶ Place the object in the center of the scale.
Once the code is read, weight and dimension values are determined.
- ▶ If a weight still cannot be determined, make sure that the MDA Vision is set up in a stable and vibration-free manner and that any drafts present in the environment do not affect the scale.
- ▶ If the problem cannot be solved by the user, contact the service technician.

7.7.7 Scale is underloaded

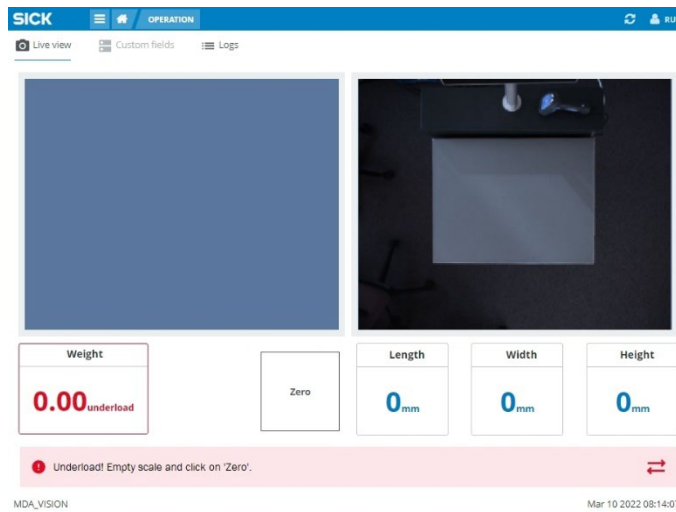


Fig. 90: Underload! Empty scale and click on Zero.

Error description

- ▶ After an object has been removed, all measured values are reset to zero.
 - However, the weight value is displayed with the addition *underload* in red font.

Fault cause

- The electronic scale shows underload.
- This may occur if very light objects were measured and the scale cannot be reset to zero after the measurement process.

Solution

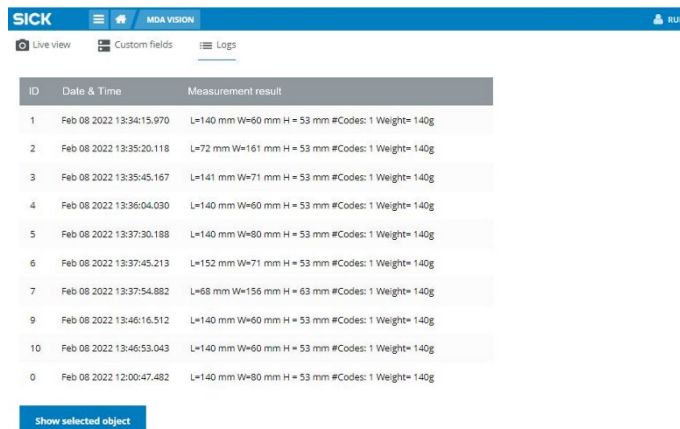
- ▶ In the measurement window, tap the **Zero** button.
- ▶ The weight value of the scale is set to zero.
The display of the zero value appears in blue letters.

7.8 Displaying last measurement results

You can display the last measurement results with the associated camera image at any time.

Measurement results

- ▶ On the navigation bar of the measurement window, tap the **Logs** tab.
 - The measurement results are listed line by line. Each message has a unique ID and a time stamp.



ID	Date & Time	Measurement result
1	Feb 08 2022 13:34:15.970	L=140 mm W=60 mm H = 53 mm #Codes: 1 Weight= 140g
2	Feb 08 2022 13:35:20.118	L=72 mm W=161 mm H = 53 mm #Codes: 1 Weight= 140g
3	Feb 08 2022 13:35:45.167	L=141 mm W=71 mm H = 53 mm #Codes: 1 Weight= 140g
4	Feb 08 2022 13:36:04.030	L=140 mm W=60 mm H = 53 mm #Codes: 1 Weight= 140g
5	Feb 08 2022 13:37:30.188	L=140 mm W=80 mm H = 53 mm #Codes: 1 Weight= 140g
6	Feb 08 2022 13:37:45.213	L=152 mm W=71 mm H = 53 mm #Codes: 1 Weight= 140g
7	Feb 08 2022 13:37:54.882	L=68 mm W=156 mm H = 63 mm #Codes: 1 Weight= 140g
9	Feb 08 2022 13:46:16.512	L=140 mm W=60 mm H = 53 mm #Codes: 1 Weight= 140g
10	Feb 08 2022 13:46:53.043	L=140 mm W=60 mm H = 53 mm #Codes: 1 Weight= 140g
0	Feb 08 2022 12:00:47.482	L=140 mm W=80 mm H = 53 mm #Codes: 1 Weight= 140g

Fig. 91: Measurement results

Image information

- ▶ Select the measurement in the list and tap the **Show selected object** button.
 - The camera image of the measurement is displayed with the determined code(s).

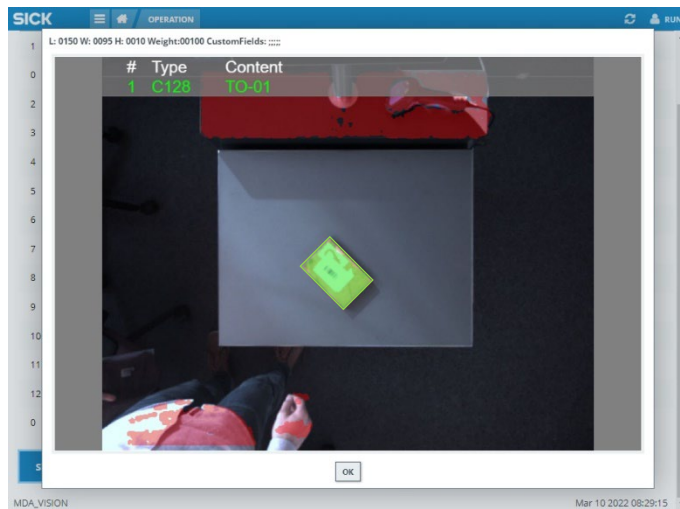


Fig. 92: Image information

- ▶ Close the image window with **OK**.

8 Configuration

8.1 Registering in the configuration area

The configuration area of the MDA Vision allows:

- Editing of the settings made in the course of initial commissioning
- Activation and configuration of multiple code reading
- Configuration of the custom input fields
- A detailed analysis of the stored camera images of a measurement

Log in

- ▶ Tap the person icon in the title bar of the window.
- ▶ Select user level and enter password using the keyboard that appears.

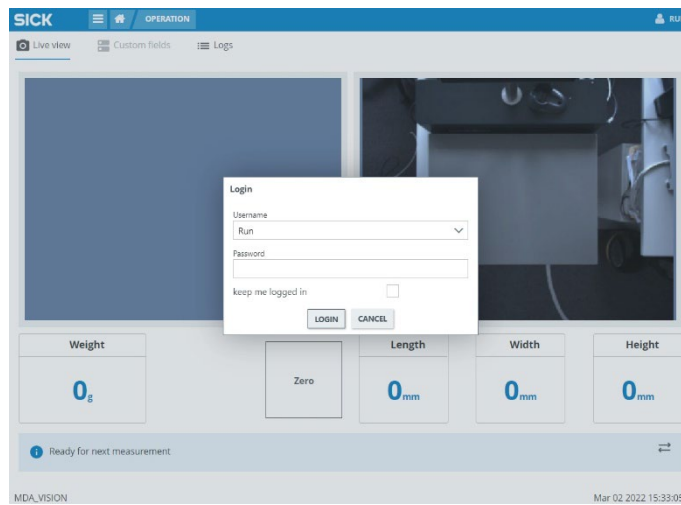


Fig. 93: Login

User	Password
Service	servicelevel

► Confirm input with **login**.

The measurement window is displayed in configuration mode. The selected user level is displayed to the right of the person icon in the **SERVICE** example.

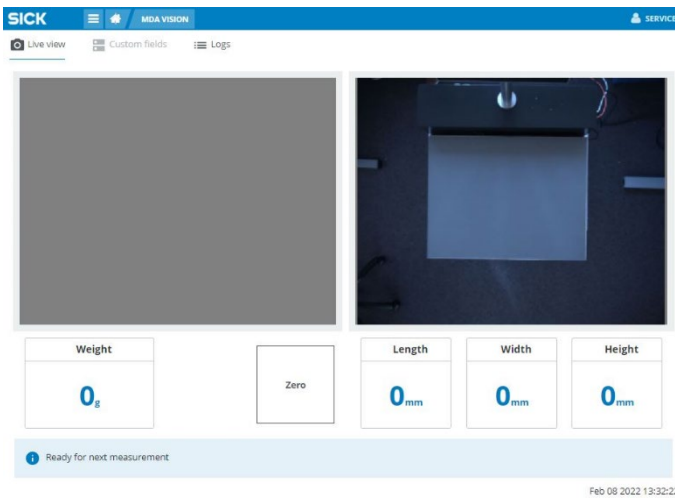


Fig. 94: Measurement window

NOTE! The login in the user level is not saved. It is only temporary. There is an automatic logout after one hour or a restart of the MDA Vision.

8.2 Adjusting or adding settings

Settings made during initial commissioning can be edited and, if necessary, supplemented in the configuration area.

The user interface language can also be changed in the configuration area.

Opening configuration area



- ▶ Tap the content icon in the menu bar.
 - The content tree of the configuration area is opened.
 - The measurement window is shifted to the right.

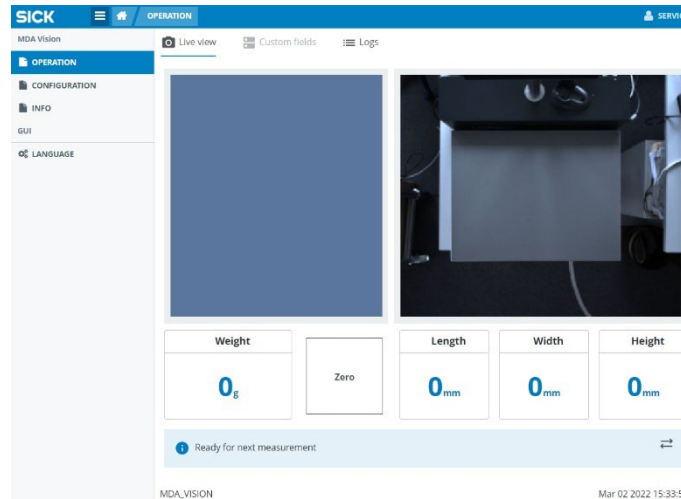


Fig. 95: Measurement window with configuration area

- ▶ In the content tree, tap **CONFIGURATION**.
 - The measurement window is hidden.
 - The settings are grouped thematically into individual tabs. The tabs correspond to the respective pages in the installation wizard.
- ▶ Tap the content icon again. The content tree is hidden.

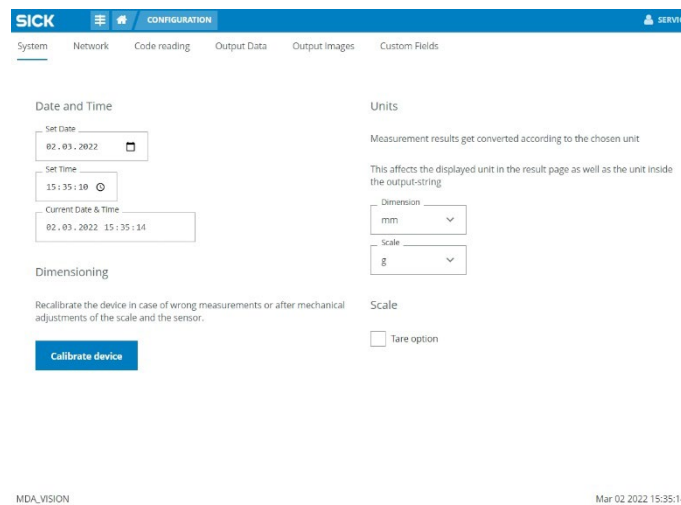


Fig. 96: Configuration System

For details on the settings, see section [6.2 Running installation wizard](#).

8.2.1 System settings

The fields in the **System** tab correspond in the upper area to the fields on the page of the same name in the installation wizard (see section [6.2.1 Basic system settings](#)).

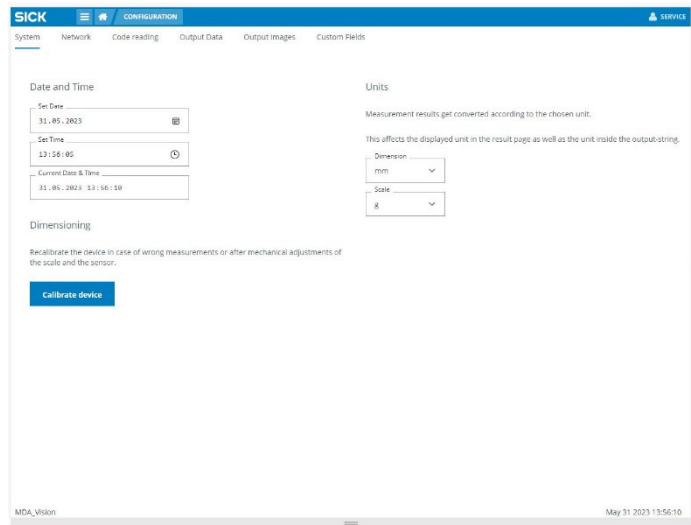


Fig. 97: Configuration System

Additional settings

Field	Explanation
Calibrate device	Enables calibration of the Visionary 3D camera (see section 8.3 Performing post-calibration).
Tare option	Displays the Tare button in the measurement window for taring the scale.

8.2.2 Network settings

The fields in the **Network** tab correspond to the fields on the page of the same name in the installation wizard (see section [6.2.2 Configuration of the network settings](#)).

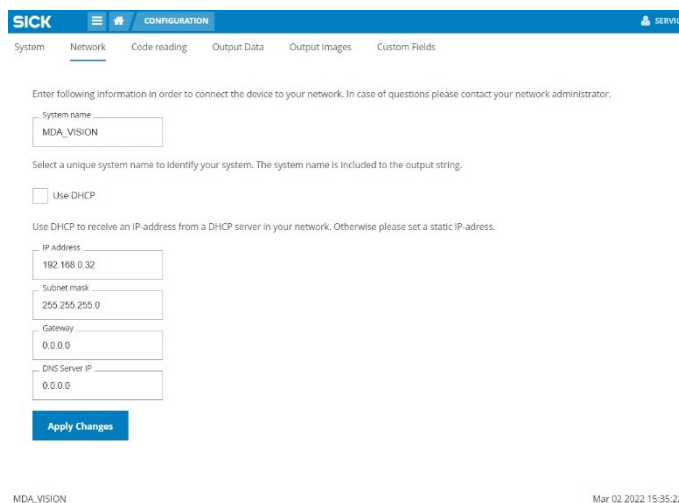


Fig. 98: Configuration System

8.2.3 Code reading settings

The fields in the **Code Reading** tab correspond in the upper area to the fields on the page with the same name in the installation wizard (see section [6.2.4 Code reading configuration](#)).

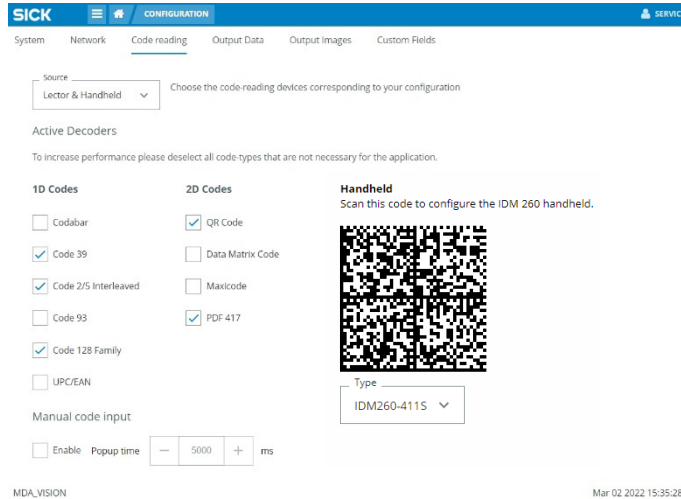


Fig. 99: Configuration Code Reading

Additional settings

Field	Explanation
Enable	Activates the display of the pop-up window after a defined timeout for manual entry of the code (see section 7.4 Manually entering the code or skipping code reading).
Popup time	Defines the amount of time to wait until the pop-up window is displayed after code reading has not taken place.

8.2.4 Configuration of the data output

The fields in the **Output Data** tab correspond to the fields on the page of the same name in the installation wizard (see section [6.2.5 Configuration of the data output](#)).

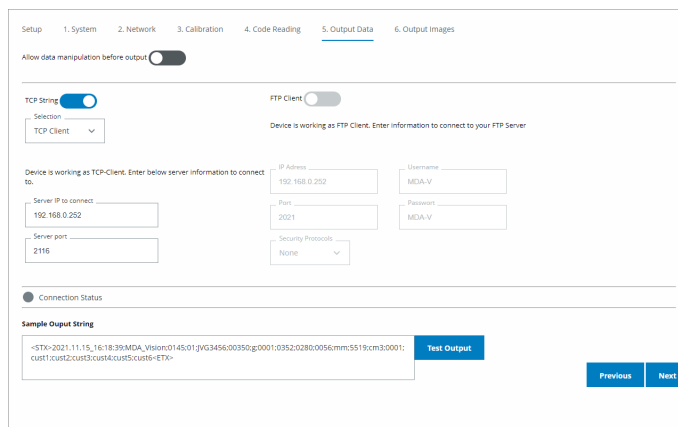


Fig. 100: Configuration Output Data

8.2.5 Image output configuration

The fields in the **Output Images** tab correspond to the fields on the page of the same name in the installation wizard (see section [6.2.6 Image output configuration](#)).

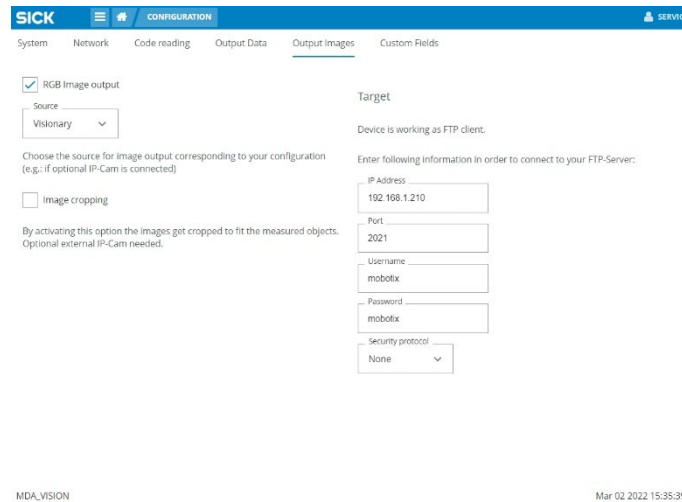


Fig. 101: Configuration Output Images

8.2.6 Defining custom additional fields

- MDA Vision allows the configuration of additional fields to add custom information to the master data.
- A distinction is made between text fields, numeric fields and selection lists.
- Up to six additional fields can be activated and configured.
- The additional fields are automatically displayed after a successful measurement, if they are activated. If no additional field has been activated, the **Custom Fields** tab will not be displayed.
- The acquired custom data is transmitted to the user system together with the object master data after the measurement.

Procedure

- ▶ In the content tree of the configuration area, tap **CONFIGURATION**.
- ▶ Switch to the **Custom Fields** tab.

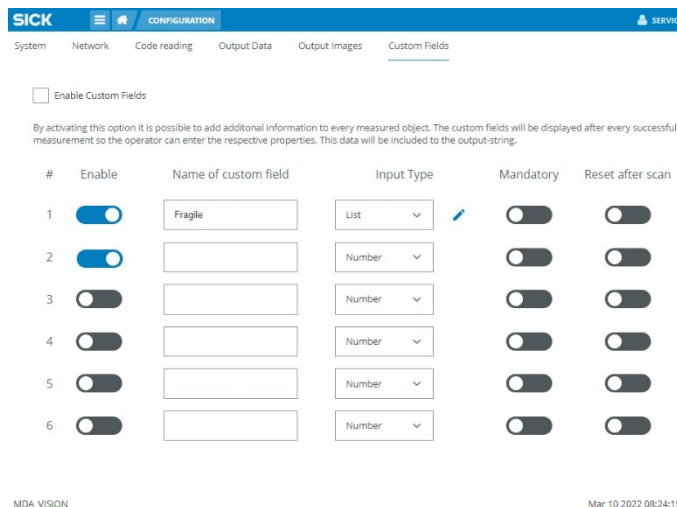


Fig. 102: Configuration Custom Fields

Settings

Field	Explanation
Enable	Activate additional fields line by line using the Enable switch. Only activated fields are displayed for custom input.
Name of custom field	Field name.
Input type	Field type. Newly activated fields are initially of type <i>Number</i> . Text fields, numeric fields and list boxes are distinguished. Text fields and numeric fields do not require any additional information. List boxes must be configured in a separate step.
Mandatory	Specifies whether the field is a mandatory field that requires mandatory input.
Reset after scan	Defines whether the additional field should be preset with the input of the last measurement.

Configuring list boxes

Selection lists give users a list with fixed entries from which they can select an entry. The list entries can be freely defined.

- ▶ Select **List** field type.
- ▶ Tap the pen icon. A pop-up window opens for entering the list entries.

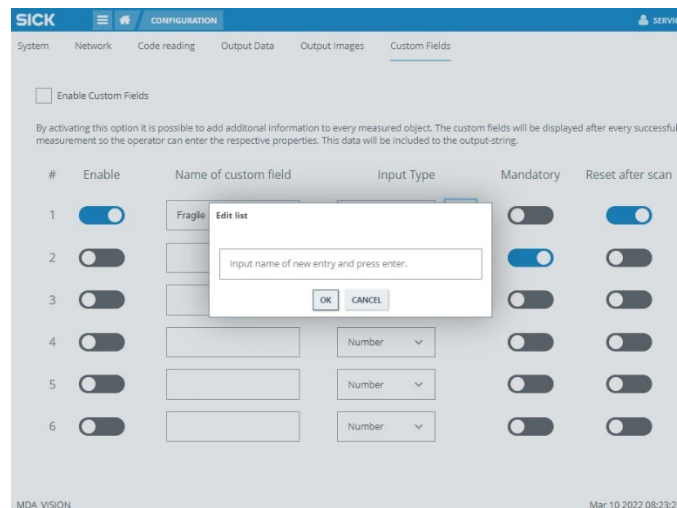


Fig. 103: Custom Fields Edit list

- ▶ Enter the first entry and confirm with **OK** or **Enter**. A keyboard is displayed for the input.

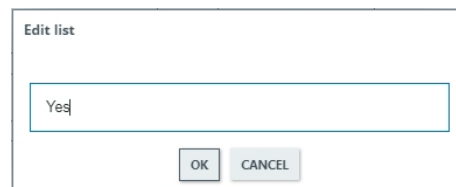


Fig. 104: Yes list entry

The first list entry is displayed above the input field.

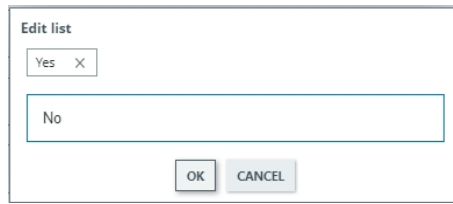


Fig. 105: No list entry

- ▶ Define further list entries as described and confirm each with **OK** or **Enter**.
 - ▶ Finish the definition of the list entries with **OK**. The pop-up window will close.
- List entries cannot be edited, only deleted and created.

Deleting list entry

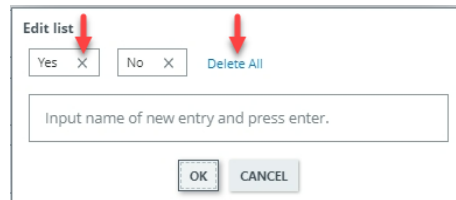


Fig. 106: Delete list entry

- ▶ Open list entries via the pencil icon.
- ▶ Tap the X in the list entry field. The entry is removed from the list.
- ▶ **Delete All** removes all entries from the list.

8.2.7 Select language.



- ▶ Show content tree of the configuration area via the menu bar.
- ▶ In the content tree, tap **LANGUAGE**.
- ▶ Select user language.

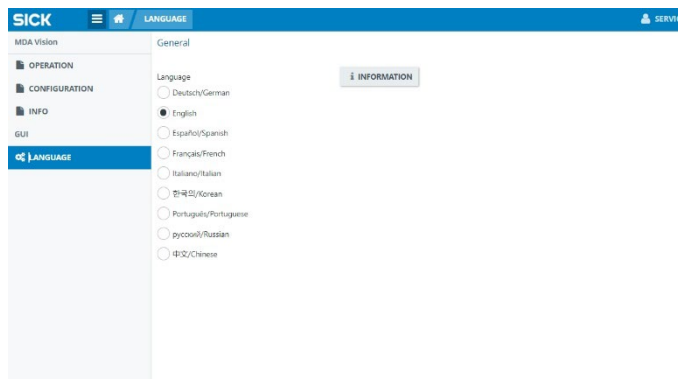


Fig. 107: Select language.

- ▶ Keep pressing in the bottom right area of the display until the display menu appears.
- ▶ Press the “Circular arrow” icon to update the language setting.

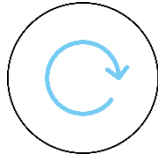


Fig. 108: "Circular arrow" icon

Switching back to the measurement window



Log out

- ▶ Tap the Home icon in the menu bar.

The measurement window is displayed. The content tree of the configuration area is automatically hidden. The selected user level remains active.

- By tapping the person icon again, the login window for changing the user level is displayed again.

8.3 Performing post-calibration

Due to vibrations or shocks or after setting up the MDA Vision at a different measuring location, recalibrating the Visionary-S 3D camera is recommended.



- ▶ Show content tree of the configuration area via the menu bar.
- ▶ In the **System** tab, tap **Calibrate device**.

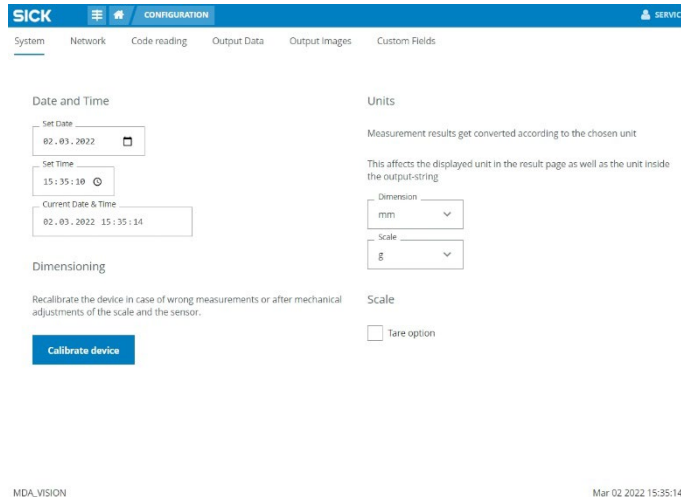


Fig. 109: Calibrate device

A note appears stating that the calibration requires a free measuring range.

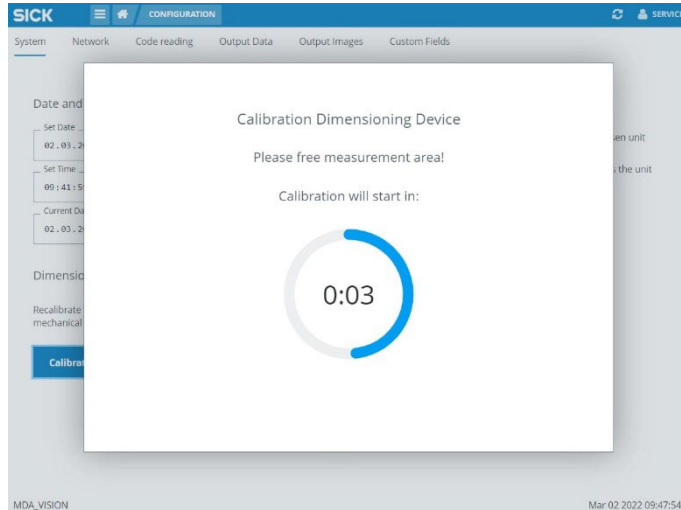


Fig. 110: Calibration

- ▶ Remove the object from the scale - if you have not already done so - and move your hands out of the field of view of the 3D camera.
- ▶ Calibration starts automatically after 5 seconds.

A message window informs about the successful completion of the calibration.

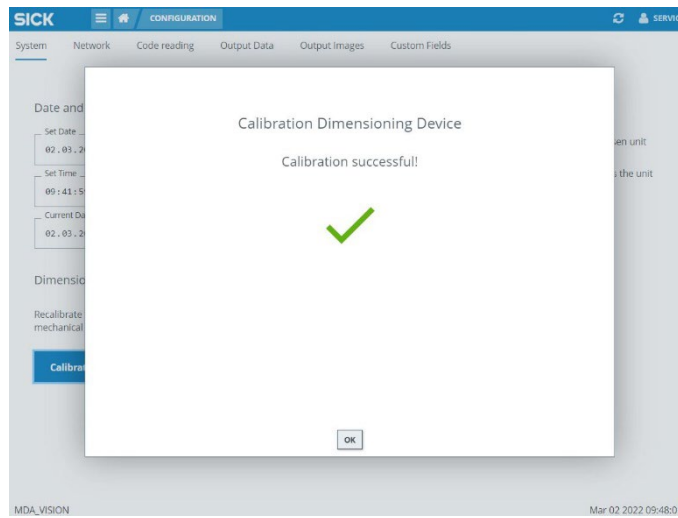


Fig. 111: Calibration successful

► Click **OK** to confirm.

9 Maintenance and repair

9.1 Maintenance intervals

Maintenance and repair measures may only be carried out by qualified persons.

Device	Maintenance task	Interval*	Version
Visionary-S	Cleaning the front screen	Monthly	Trained personnel
Lector6xx	Cleaning the front screen	Monthly	Trained personnel
Color camera	Cleaning the front screen	Monthly	Trained personnel
Scale	Visual monitoring for contamination	Daily	Trained personnel
General	Visual monitoring for contamination	Daily	Trained personnel
	Control measurements with test objects to check the measurement accuracy of the multi-dimensional measurement system	Whenever the system is started	Trained personnel
	Visual electrical cabling check and as well as visual inspection of wiring for damage	Annually	Trained personnel
* The intervals depend on the ambient conditions and degree of contamination. In addition, the intervals must be defined according to how important they are for the user process.			

Tab. 1: Maintenance intervals

9.2 Cleaning sensor components

⚠ WARNING!

HAZARDOUS LASER RADIATION

The Lector6xx image-based code readers work with a laser class 1 aiming laser.

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

- ▶ Never look directly into the laser beam.
 - ▶ Never point the laser beam at people's eyes.
 - ▶ During commissioning or maintenance work, suitable eye protection must be worn.
 - ▶ Avoid laser beam reflection caused by reflective surfaces.
In particular during mounting and alignment work.
 - ▶ Do not open the housing.
 - ▶ Current national regulations regarding laser protection must be observed.
-

⚠ WARNING!

DANGEROUS LED RADIATION

The Lector 6xx image-based code reader operates with RG1 risk group LEDs.
Visible radiation, 400 nm to 780 nm.

The LEDs may pose a danger to the eyes in the event of incorrect use.

- ▶ Do not intentionally look into the light source.
 - ▶ Do not point the light source at people and prevent reflections of the light source from reflective surfaces onto people.
 - ▶ During commissioning or maintenance work, suitable eye protection must be worn.
 - ▶ Do not open the housing.
 - ▶ Comply with the recent national version of the applicable standards on photobiological safety of lamps and lamp systems.
-

**Cleaning the
optical surfaces
of the sensors**



Fig. 112: Cleaning the optical surfaces of the sensors

- ▶ Switch off the device during cleaning.
- ▶ Dust the front screen of the sensor with a clean and soft brush.
- ▶ Then wipe the front screen with a clean, damp, lint-free cloth.
Use a mild, anti-static lens cleaning fluid if necessary.

• **CAUTION!**

REDUCED READING PERFORMANCE DUE TO SCRATCHES OR STREAKS ON THE OPTICAL BOUNDARY SURFACE

The optical output is weakened by scratches and streaks on the optical boundary surface.

- ▶ Do not use aggressive cleaning agents.
 - ▶ Do not use abrasive cleaning agents.
 - ▶ Avoid any movements that could cause scratches or abrasions on the front screen.
-

9.3 Replacing sensors

⚠ WARNING!

HAZARDOUS LASER RADIATION

The Lector6xx image-based code readers work with a laser class 1 aiming laser.

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 - ▶ Never point the laser beam at people's eyes.
 - ▶ During commissioning or maintenance work, suitable eye protection must be worn.
 - ▶ Avoid laser beam reflection caused by reflective surfaces.
In particular during mounting and alignment work.
 - ▶ Do not open the housing.
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-

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 - ▶ Do not point the light source at people and prevent reflections of the light source from reflective surfaces onto people.
 - ▶ During commissioning or maintenance work, suitable eye protection must be worn.
 - ▶ Do not open the housing.
 - ▶ Comply with the recent national version of the applicable standards on photobiological safety of lamps and lamp systems.
-

9.3.1 Replacing 3D snapshot Camera

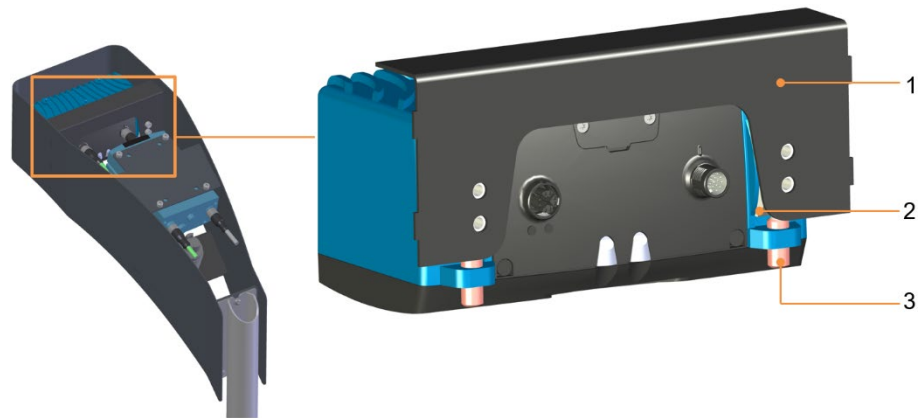


Fig. 113: Replacing 3D snapshot camera

Legend

- 1 Mounting plate
- 2 Terminal blocks
- 3 Clamping screws

Removal

- ▶ Switch off the device using the main switch of the MDA Vision.
- ▶ Unscrew all connecting cables from the defective device.
- ▶ Unscrew and remove the clamping screws on both sides.

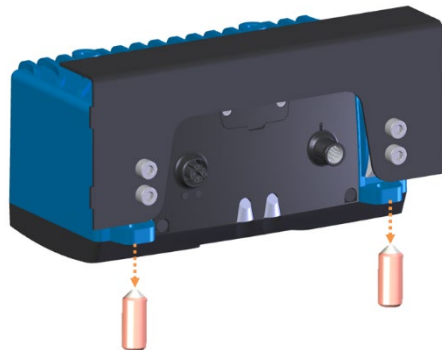


Fig. 114: Loosening and removing clamping screws

- ▶ Tilt the camera away from the front.
- ▶ Slide the camera upward and unhook it from the clamping blocks.

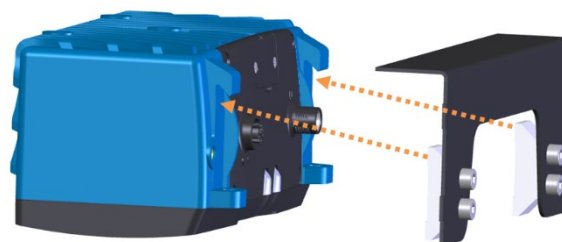


Fig. 115: Unhooking the camera from the clamping blocks

Mounting

- ▶ Insert the clamping blocks into the replacement device and fix them with the clamping screws.
- ▶ Screw the replacement device back onto the mounting plate.
- ▶ Screw the connecting cables back on (see section [4.3.3 Mounting and connecting sensor head](#)).

9.3.2 Replacing the Lector6xx

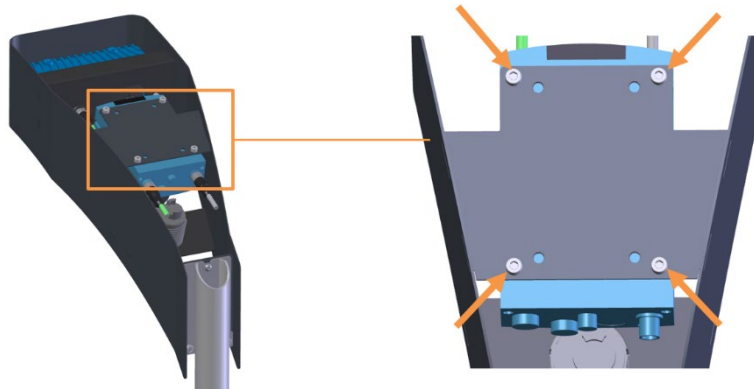


Fig. 116: Replacing Lector6xx

Removal

- ▶ Switch off the device using the main switch of the MDA Vision.
- ▶ Unscrew all connecting cables from the defective device.
- ▶ Secure the Lector against falling.
- ▶ Loosen and remove the four fixing screws on the mounting plate.
- ▶ Remove the defective Lector from the bracket. The mounting plate remains mounted on the frame of the sensor box.

Removing the microSD card

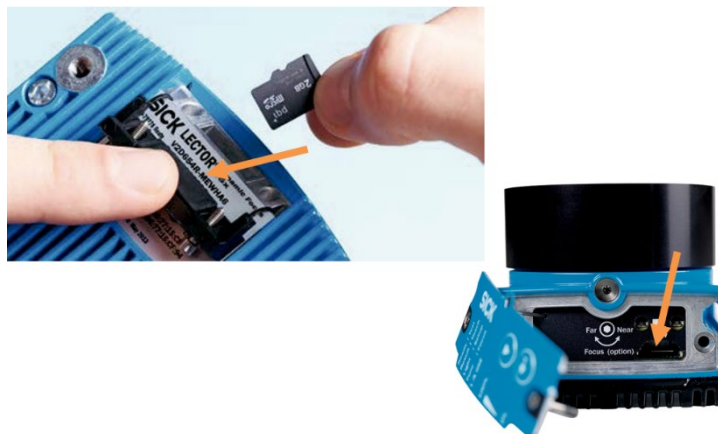


Fig. 117: Removing the memory card from a defective Lector6xx

- ▶ Loosen both hexagon socket screws of the cover using the SW 2 hex key.
- ▶ Push the cover away from the device until the card slot can be accessed.
- ▶ Pull the memory card out of the card slot.

Installing the microSD card in the replacement device

- ▶ 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.
- ▶ Slide the cover back over the device.
- ▶ Screw the cover back on tight.

Mounting

- ▶ Screw the replacement device back onto the mounting plate.
- ▶ Screw the connecting cables back on (see section [4.3.3 Mounting and connecting sensor head](#)).

9.3.3 Replacing color camera

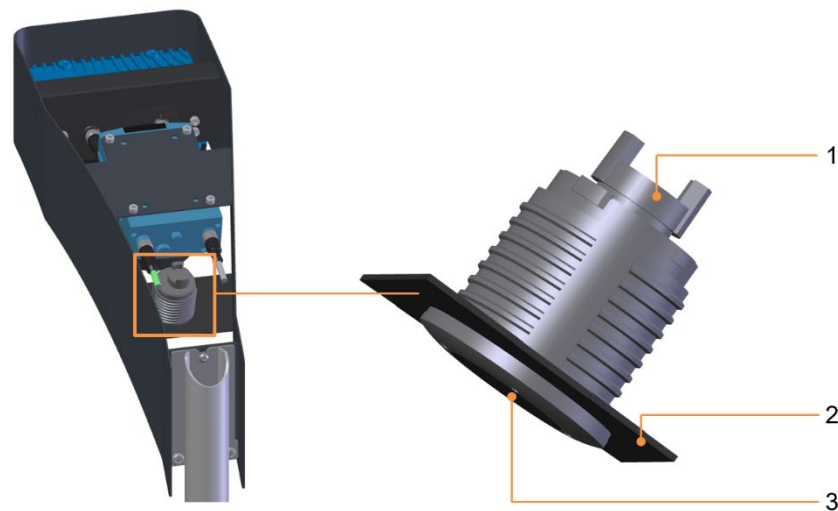


Fig. 118: Replacing color camera

Legend

- 1 Cable fuse
 - 2 Mounting plate
 - 3 Camera lens
-

Removal

- ▶ Switch off the device using the main switch of the MDA Vision.
- ▶ Unscrew the connecting cable from the defective device.
- ▶ Secure the camera against falling.
- ▶ Screw on the counter nut.
- ▶ Pull the camera forward out of the mounting plate.

Mounting

- ▶ Place the replacement unit back on the mounting plate and tighten it with the counter nut.
- ▶ Screw the connecting cables back on (see section [4.3.3 Mounting and connecting sensor head](#)).

9.4 Cleaning the connection unit

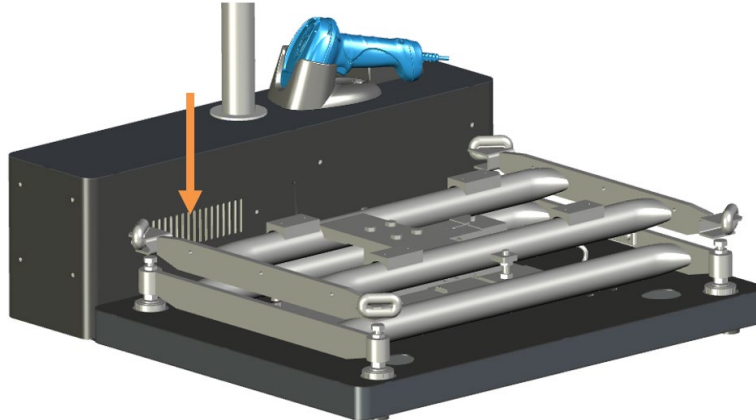


Fig. 119: Cleaning the connection unit

- ▶ Remove the plate from the scale. The air grille of the connection unit is now accessible.
- ▶ Clean the air grille with a brush.
- ▶ Vacuum coarser contaminants with an industrial vacuum cleaner.
- ▶ Do not use compressed air.

10 Notes and status messages

Message	Recommended procedure
<i>Device <NAME> is missing.</i>	<ul style="list-style-type: none"> ▶ Restart MDA Vision. To do this, switch the device off and on again at the main switch. ▶ If the error still occurs, contact SICK Service.
<i>No connection to Host.</i>	<ul style="list-style-type: none"> • The arrow symbol changes from green to red. • Measurements are still possible, but the results are not transmitted to the HOST interface. ▶ Check connection settings. ▶ If you have any questions, contact the network administrator in charge.
<i>Place object centered on scale for measurement</i>	<ul style="list-style-type: none"> • The object is not placed in the reading field. • The object is too large. ▶ See section 7.7.3 Object not placed in the reading field
<i>Place barcode near by the aiming laser.</i>	<ul style="list-style-type: none"> • An object was brought into the field of view of the sensors. But the Lector could not read a bar code. ▶ See section 7.7.2 No code reading.
<i>Please free measurement are at start up.</i>	<ul style="list-style-type: none"> • The system was started up with an object on the scale. ▶ See section 7.7.1 No free measuring range after system start.
<i>Object too small: <DIMENSIONS></i>	<ul style="list-style-type: none"> • One or more object dimensions fall below the permissible dimensions. ▶ See section 7.7.4 Object is too small.
<i>Confirm custom fields</i>	<ul style="list-style-type: none"> • The custom fields entered were not confirmed. ▶ See section 7.7.5 Custom Fields were not confirmed.
<i>No stable weight!</i>	<ul style="list-style-type: none"> • No stable object weight could be determined. ▶ See section 7.7.6 No stable object weight.
<i>Scale underload! Please free Scale and click on "Zero</i>	<ul style="list-style-type: none"> • The scale is in underload. ▶ See section 7.7.7 Scale is underloaded.
<i>Next step needs a valid weight</i>	<ul style="list-style-type: none"> • The object is too light. ▶ Only measure objects whose weight corresponds to the technical data.
<i>Scale overload!</i>	<ul style="list-style-type: none"> • The object is too heavy. ▶ Only measure objects whose weight corresponds to the technical data.

Tab. 2: Notes and status messages

11 TECHNICAL DATA

11 Technical data

11.1 Data sheet

Information can be found on the home page at www.sick.com.

11.2 Dimensional drawings

Front view

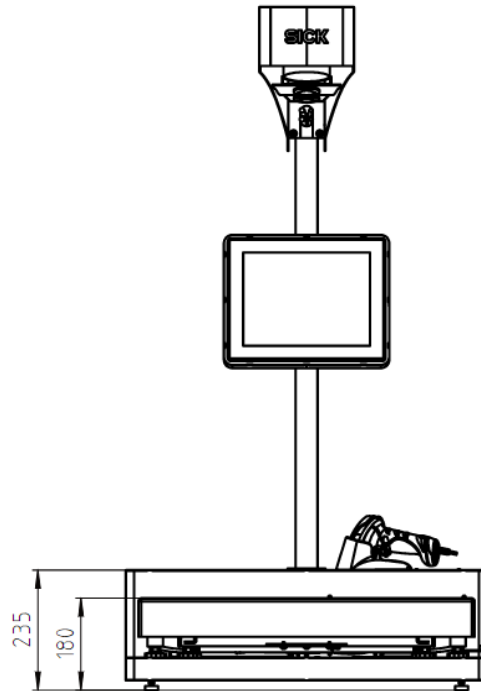


Fig. 120: Dimensional drawing of MDA Vision (front view)

Side view

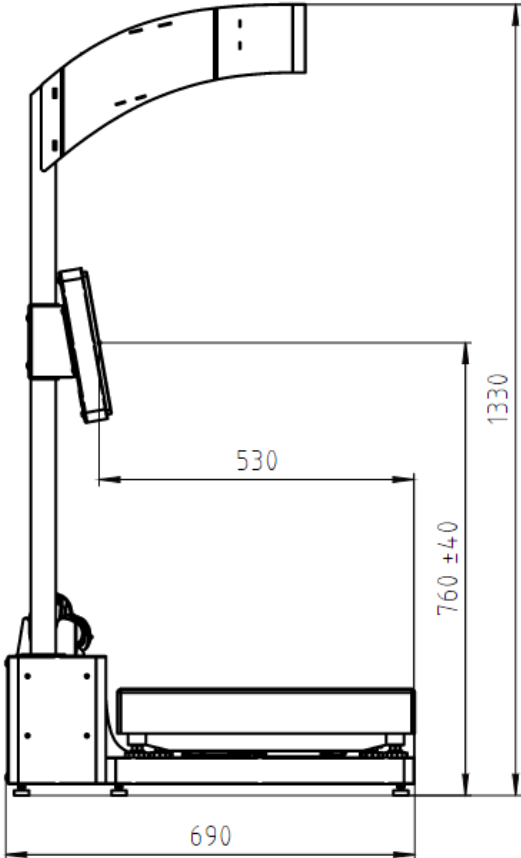


Fig. 121: Dimensional drawing of MDA Vision (side view)

Top view

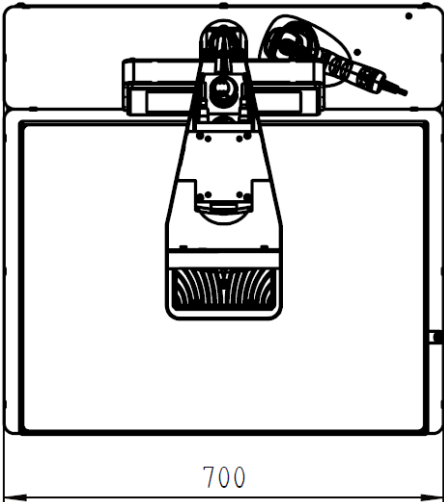


Fig. 122: Dimensional drawing of MDA Vision (top view)

12 GEO CODES

12 GEO codes

The GEO code allows the scale to be calibrated based on latitude or altitude without applying test weights.

Latitude north or south in degrees and minutes	Height above sea level in meters										
	0	325	650	975	1,300	1,625	1,950	2,275	2,600	2,925	3,250
	325	650	975	1,300	1,625	1,950	2,275	2,600	2,925	3,250	3,575
	Height above sea level in feet										
	0	1,060	2,130	3,200	4,260	5,330	6,400	7,460	8,530	9,600	10,660
	1,060	2,130	3,200	4,260	5,330	6,400	7,460	8,530	9,600	10,660	11,730
0° 0'-5° 46'	5	4	4	3	3	2	2	1	1	0	0
5° 46'-9° 52'	5	5	4	4	3	3	2	2	1	1	0
9° 52'-12° 44'	6	5	5	4	4	3	3	2	2	1	1
12° 44'-15° 6'	6	6	5	5	4	4	3	3	2	2	1
15° 6'-17° 0'	7	6	6	5	5	4	4	3	3	2	2
17° 10'-19° 2'	7	7	6	6	5	5	4	4	3	3	2
19° 2'-20° 45'	8	7	7	6	6	5	5	4	4	3	3
20° 45'-22° 22'	8	8	7	7	6	6	5	5	4	4	3
22° 22'-23° 54'	9	8	8	7	7	6	6	5	5	4	4
23° 54'-25° 21'	9	9	8	8	7	7	6	6	5	5	4
25° 21'-26° 45'	10	9	9	8	8	7	7	6	6	5	5
26° 45'-28° 6'	10	10	9	9	8	8	7	7	6	6	5
28° 6'-29° 25'	11	10	10	9	9	8	8	7	7	6	6
29° 25'-30° 41'	11	11	10	10	9	9	8	8	7	7	6
30° 41'-31° 56'	12	11	11	10	10	9	9	8	8	7	7
31° 56'-33° 9'	12	12	11	11	10	10	9	9	8	8	7
33° 9'-34° 21'	13	12	12	11	11	10	10	9	9	8	8
34° 21'-35° 31'	13	13	12	12	11	11	10	10	9	9	8
35° 31'-36° 41'	14	13	13	12	12	11	11	10	10	9	9
36° 41'-37° 50'	14	14	13	13	12	12	11	11	10	10	9
37° 50'-38° 58'	15	14	14	13	13	12	12	11	11	10	10
38° 58'-40° 5'	15	15	14	14	13	13	12	12	11	11	10
40° 5'-41° 12'	16	15	15	14	14	13	13	12	12	11	11
41° 12'-42° 19'	16	16	15	15	14	14	13	13	12	12	11
42° 19'-43° 26'	17	16	16	15	15	14	14	13	13	12	12
43° 26'-44° 32'	17	17	16	16	15	15	14	14	13	13	12

Latitude north or south in degrees and minutes	Height above sea level in meters										
	0	325	650	975	1,300	1,625	1,950	2,275	2,600	2,925	3,250
	325	650	975	1,300	1,625	1,950	2,275	2,600	2,925	3,250	3,575
	Height above sea level in feet										
	0	1,060	2,130	3,200	4,260	5,330	6,400	7,460	8,530	9,600	10,660
1,060	2,130	3,200	4,260	5,330	6,400	7,460	8,530	9,600	10,660	11,730	
44° 32'-45° 38'	18	17	17	16	16	15	15	14	14	13	13
45° 38'-46° 45'	18	18	17	17	16	16	15	15	14	14	13
46° 45'-47° 51'	19	18	18	17	17	16	16	15	15	14	14
47° 51'-48° 58'	19	19	18	18	17	17	16	16	15	15	14
48° 58'-50° 6'	20	19	19	18	18	17	17	16	16	15	15
50° 6'-51° 13'	20	20	19	19	18	18	17	17	16	16	15
51° 13'-52° 22'	21	20	20	19	19	18	18	17	17	16	16
52° 22'-53° 31'	21	21	20	20	19	19	18	18	17	17	16
53° 31'-54° 41'	22	21	21	20	20	19	19	18	18	17	17
54° 41'-55° 52'	22	22	21	21	20	20	19	19	18	18	17
55° 52'-57° 4'	23	22	22	21	21	20	20	19	19	18	18
57° 4'-58° 17'	23	23	22	22	21	21	20	20	19	19	18
58° 17'-59° 32'	24	23	23	22	22	21	21	20	20	19	19
59° 32'-60° 49'	24	24	23	23	22	22	21	21	20	20	19
60° 49'-62° 9'	25	24	24	23	23	22	22	21	21	20	20
62° 9'-63° 30'	25	25	24	24	23	23	22	22	21	21	20
63° 30'-64° 55'	26	25	25	24	24	23	23	22	22	21	21
64° 55'-66° 24'	26	26	25	25	24	24	23	23	22	22	21
66° 24'-67° 57'	27	26	26	25	25	24	24	23	23	22	22
67° 57'-69° 35'	27	27	26	26	25	25	24	24	23	23	22
69° 5'-71° 21'	28	27	27	26	26	25	25	24	24	23	23
71° 21'-73° 16'	28	28	27	27	26	26	25	25	24	24	23
73° 16'-75° 24'	29	28	28	27	27	26	26	25	25	24	24
75° 24'-77° 52'	29	29	28	28	27	27	26	26	25	25	24
77° 52'-80° 56'	30	29	29	28	28	27	27	26	26	25	25
80° 56'-85° 45'	30	30	29	29	28	28	27	27	26	26	25
85° 45'-90° 00'	31	30	30	29	29	28	28	27	27	26	26

Tab. 3 GEO codes

13 Disposal

- ▶ The applicable local and statutory environmental regulations and guidelines for the disposal of industrial and electrical waste must be observed.

Disposal of batteries, electrical and electronic devices.

- ▶ In accordance with international directives and regulations, batteries, accumulators, and electrical or electronic devices must not be disposed of with household waste.
- ▶ The owner is obligated to dispose of the devices at the end of their service life via the appropriate public disposal points.
- ▶ This icon on the product, packaging, or in this document indicates that a product is covered by these provisions.



The following assemblies may contain substances that need to be disposed of separately:

- **Electronics:**

Capacitors, accumulators, batteries.

- **Displays:**

Liquid in the LC displays.

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