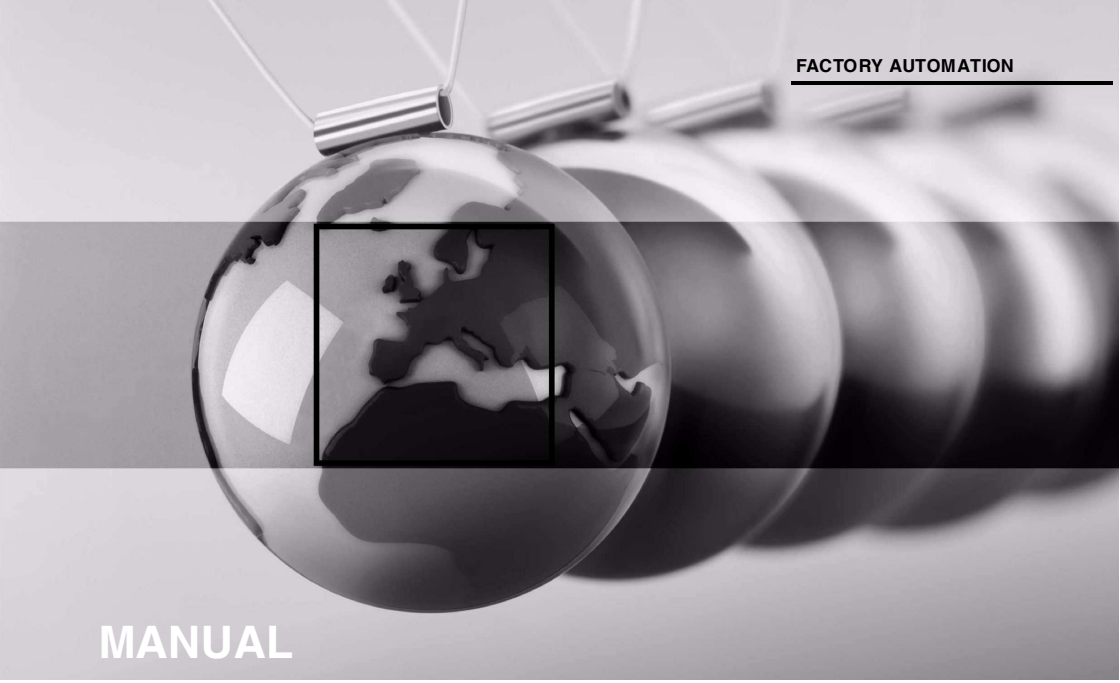

MANUAL

# PHA...-F200*-R3*

## Vision Sensor
## for Rack Fine Positioning


CE

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SENSING YOUR NEEDS

With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

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# 1 Introduction

**Congratulations**

You have chosen a device manufactured by Pepperl+Fuchs. Pepperl+Fuchs develops, produces and distributes electronic sensors and interface modules for the market of automation technology on a worldwide scale.

**Symbols used**

The following symbols are used in this manual:

***Note!***

This symbol draws your attention to important information.

Handling instructions

You will find handling instructions beside this symbol

**Contact**

If you have any questions about the device, its functions, or accessories, please contact us at:

Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim, Germany
Telephone: +49 (0)621 776-1111
Fax: +49 (0)621 776-271111
Email: fa-info@de.pepperl-fuchs.com

# 2 Declaration of Conformity

This product was developed and manufactured under observance of the applicable European standards and guidelines.

***Note!***

A declaration of conformity can be requested from the manufacturer.

The product manufacturer, Pepperl+Fuchs GmbH, D-68307 Mannheim, has a certified quality assurance system that conforms to ISO 9001.

ISO9001

# 3 Safety

## 3.1 Symbols Relevant to Safety


***Danger!***
This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

***Warning!***
This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

***Caution!***
This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

## 3.2 Intended Use

The device is a Vision Sensor for rack fine positioning to a hole reference mark. The sensor is used in high-rack warehouses. Use the sensor only for its intended purpose.


***Danger!***
Moving parts

In applications involving stock feeders and moving carriages, care must be taken to ensure that the applicable safety regulations are observed at all times. Failure to do so may result in serious or fatal injury.

## 3.3 General Safety Instructions

Always operate the device as described in these instructions to ensure that the device and connected systems function correctly. The protection of operating personnel and plant is only guaranteed if the device is operated in accordance with its intended use.

The operating company bears responsibility for observing locally applicable safety regulations.

Installation and commissioning of all devices may be performed only by personnel specially trained for that purpose.

User modification and or repair are dangerous and will void the warranty and exclude the manufacturer from any liability. If serious faults occur, stop using the device. Secure the device against inadvertent operation. In the event of repairs, return the device to your local Pepperl+Fuchs representative or sales office.

# 4 Product Description

## 4.1 Vision Sensor for Rack Fine Positioning — Use and Applications

The PHA*...-F200* Vision Sensor for rack fine positioning from Pepperl+Fuchs facilitates fast and simple positioning of stock feeders. The Vision Sensor detects circular holes in the rack structure and determines their position deviation in the X and Y directions relative to the target position.

The Vision Sensor comprises:

- Camera
- Lighting unit
- Evaluation computer with digital input and output signals
- Service interface


Figure 4.1

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## 4.2 Displays and Controls

The Vision Sensor unit has 7 LED indicators on the top that provide information on the various statuses of the device.

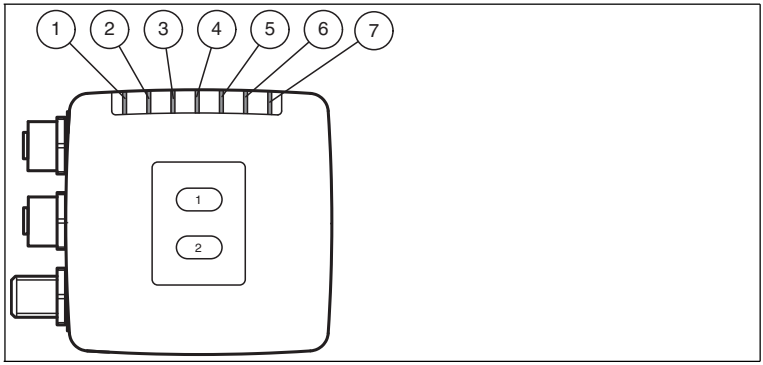


Figure 4.2 Indication operating side

1. **+X position**
   LED yellow. Indicates wether the sensor is within the tolerance range.
2. **-X position**
   LED yellow. Indicates wether the sensor is within the tolerance range.
3. **+Y position**
   LED yellow. Indicates wether the sensor is within the tolerance range.
4. **-Y position**
   LED yellow. Indicates wether the sensor is within the tolerance range.
5. **POWER (PWR)**
   LED green: Lights up, when the sensor is operational.
6. **DIAG 1**
   Dual-LED: Flashing red / yellow with approx. 1 Hz when the vision sensor is operational.
7. **DIAG 2**
   Dual-LED: Flashing red / yellow with approx. 1 Hz when the vision sensor is operational.

LEDs are mounted around the camera element on the front of the Vision Sensor. The LEDs are used for light, to align the X and Y position, and for the status display.

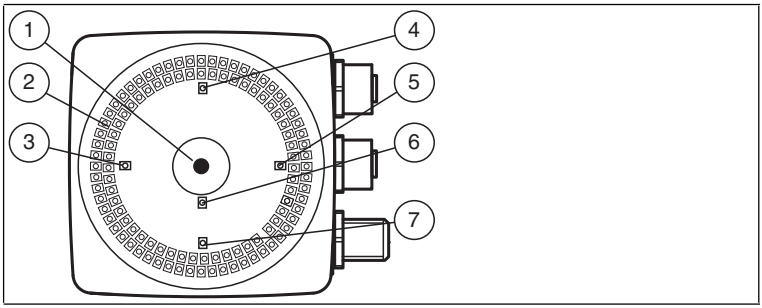


Figure 4.3 Displays on the camera side

1. Camera
2. Infrared illumination LEDs
3. **-X position**
   Red LED. Indicates whether the sensor is within the tolerance range.
4. **-Y position**
   Red LED. Indicates whether the sensor is within the tolerance range.
5. **+X position**
   Red LED. Indicates whether the sensor is within the tolerance range.
6. **Normal operation**
   Red LED. Flashes when the sensor is in normal operation.
7. **+Y position**
   Red LED. Indicates whether the sensor is within the tolerance range.

Two operating buttons are mounted on the back of the Vision Sensor. You can use these operating buttons to reset the IP address of the device to the default value. see "Resetting the IP Address" on page 32

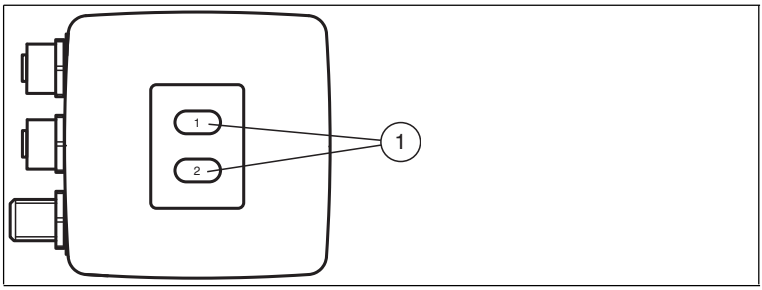


Figure 4.4 Controls

(1) Operating buttons 1 and 2

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## 4.3 Interfaces and Connections

The device includes the following connections:

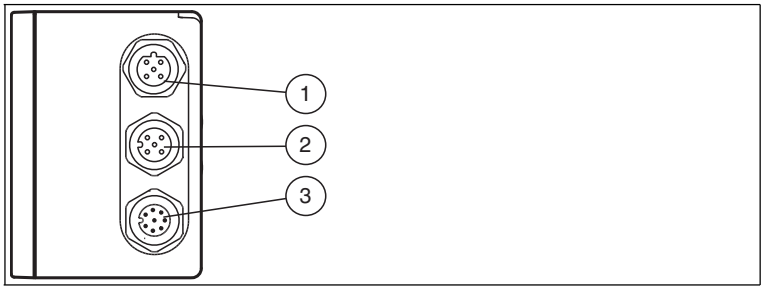


Figure 4.5 Device connections

1. LAN (service interface, 4-pin M12 socket, D-coded)
2. RS422 connection (PLC, 5-pin M12 socket)
3. 24 VDC + IO (power supply, inputs and outputs, 8-pin M12 connector)

### 1 Service interface

There is a 4-pin M12 socket on the side of the housing for connecting a PC. The reader can be configured using the "Vision Configurator" software. This software is available to download from www.pepperl-fuchs.com

The following diagram shows the pin assignment of the service interface:

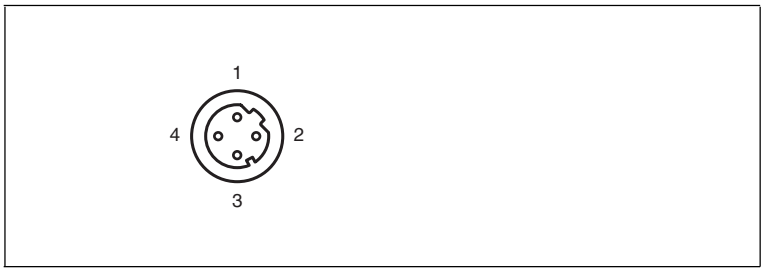


Figure 4.6 Layout service interface

**1** TX+ Ethernet
**2** RX+ Ethernet
**3** TX- Ethernet
**4** RX- Ethernet

## 2 RS 422

There is a 5-pin M12 socket on the side of the housing for connecting to the PLC. The following diagram shows the pin assignment:

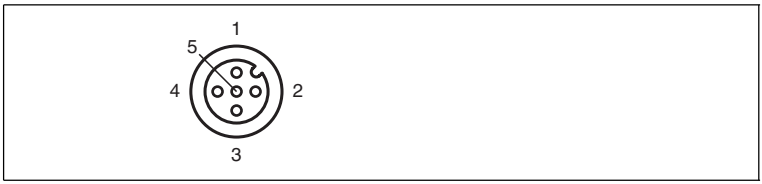


Figure 4.7 RS 422 connection layout

**1** RX+
**2** TX-
**3** RX-
**4** TX+
**5** NC

## 3 24 VDC + IO (power supply, inputs and outputs)

There is an 8-pin M12 connector on the side of the housing to connect the power supply and the inputs and outputs. The following diagram shows the pin assignment:

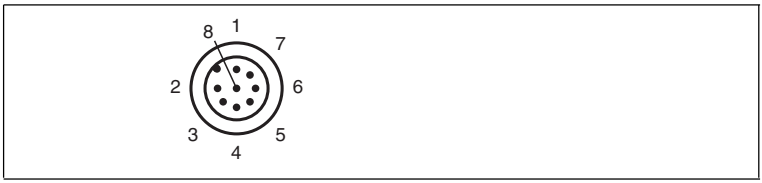


Figure 4.8 Connection operating voltage, inputs and outputs

**1** OUT +X
**2** +UB
**3** OUT +Y
**4** OUT -Y
**5** OUT -X
**6** IN 1 Cycle stop
**7** GND
**8** IN 2 Relative position

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## 4.4 Scope of Delivery

- PHA*

Appropriate mounting hardware, cables, and other information can be found in the Accessories section and at http://www.pepperl-fuchs.com.

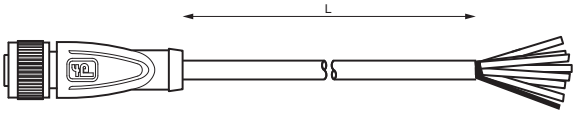
## 4.5 Accessories

Various accessories are available.

### 4.5.1 Power Supply

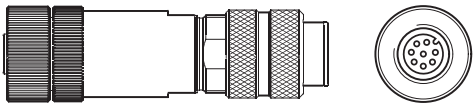
Use the following double-ended cordset to connect the power supply, inputs, and outputs to the sensor.

**Female field connector**

| Model number |  | | |
|---|---|---|---|
| V19-G-2M-PUR-ABG | 8-pin M12 socket, straight | L = 2 m | Open cable end with multistranded conductors |
| V19-G-5M-PUR-ABG | 8-pin M12 socket, straight | L = 5 m | Open cable end with multistranded conductors |
| V19-G-10M-PUR-ABG | 8-pin M12 socket, straight | L = 10 m | Open cable end with multistranded conductors |

Other lengths on request.

**Field-attachable M12 socket**

| Model number |  |
|---|---|
| V19-G-ABG-PG9 | ■ 8-pin M12 socket, straight<br>■ Screw terminals for max. 0.75 mm$^2$ PG9 cable gland<br>■ Cable diameter: 5 mm ... 8 mm |

### 4.5.2 Network Cable

The sensor is connected to the network using an M12 plug.

| Designation | Description |
|---|---|
| V45-G | RJ45 network plug, field attachable |
| V1S-G | M12 plug, 4-pin, field attachable |
| V1SD-G-2M-PUR-ABG-V45X-G | Cordset, RJ45 network plug with M12 plug, crossed, 4-pin |
| V1SD-G-2M-PUR-ABG-V45-G | Cordset, RJ45 network plug with M12 plug, 4-pin |

### 4.5.3 RS-422 Interface

The sensor's RS-422 interface is connected via an M12 plug.

| Designation | Description |
|---|---|
| V15S-G-5M-PUR-ABG | Male single-ended cordset, M12, 5-pin, PUR cable, shielded cap nut |
| V15S-G-5M-PUR-ABG-SUBD9 | Cordset, M12 plug, 5-pin, to D-Sub housing, 9-pin |

**Note**

If you use your Vision Sensor in a refrigeration application at below -20 °C, please ask us for special cables.

# 5 Installation

## 5.1 Storage and Transport

For storage and transport purposes, package the unit using shockproof packaging material and protect it against moisture. The best method of protection is to package the unit using the original packaging. Furthermore, ensure that the ambient conditions are within allowable range.

## 5.2 Preparation

### Unpacking the unit

1. Check that all package contents are present and undamaged.

   ↳ If anything is damaged, inform the shipper and contact the supplier.

2. Check that all items are present and correct based on your order and the shipping documents.

   ↳ If you have any questions, please contact Pepperl+Fuchs.

3. Keep the original packing material in case you need to store or ship the unit at a later time.

## 5.3 Mounting the Sensor

***Note!***

***Mounting an optical device***

- Do not aim the sensor at the sun.
- Protect the sensor from direct long-term exposure to sun.
- Prevent condensation from forming by not exposing the sensor to any major fluctuations in temperature.
- Do not expose the sensor to the effects of any aggressive chemicals.
- Keep the lenses and reflector of the device clean. Clean with a soft cloth, using standard commercial glass cleaner if necessary.

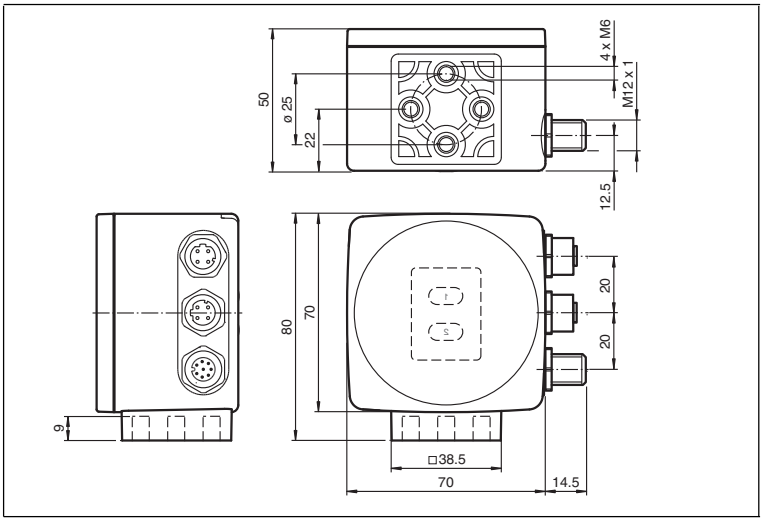
We recommend to clean the optical surface and to check screw fittings and electrical connections at regular intervals.

The device is equipped with a mounting block with four symmetrical M6 threads.

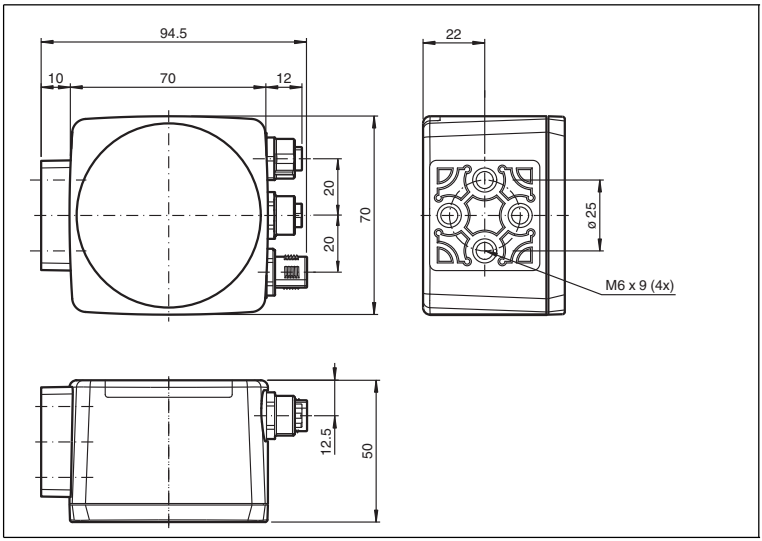
The operating distance differs depending on the sensor. The correct operating distance can be found in the technical data for the sensor to be installed.

The following illustration shows the housing dimensions in mm:

**Housing variant: PHA*-F200-***




**Housing variant: PHA*-F200A-***




The surface must be level to prevent the housing from becoming distorted when the fittings are tightened. We advise securing the screws with spring disks in order to prevent the sensor becoming misaligned. After mounting the sensor, ensure that there is still sufficient space for the connecting cable.

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## 5.4 Connecting the Sensor

### Connecting the Supply Voltage

To supply voltage to the sensor, proceed as follows:

1. Plug the 8-pin M12 socket into the **24 VDC + IO** connector on the side of the housing. .
2. Screw the cap nut onto the connector as far as it will go. This ensures that the power cable cannot be pulled out accidentally.
3. Next connect the power supply to the corresponding pin on the M12 socket.


Figure 5.1 Connection operating voltage, inputs and outputs

**1** OUT +X
**2** +UB
**3** OUT +Y
**4** OUT -Y
**5** OUT -X
**6** IN 1 Cycle stop
**7** GND
**8** IN 2 Relative position

↳ The supply voltage has now been connected.

***Tip***

To connect the sensor to the supply voltage more quickly, you can also use the preconfigured connecting cable. This can be found in the Accessories section.

# 6 Commissioning

## 6.1 Sensor Functionality

The PHA...-F200* Vision Sensor detects circular holes in the rack structure and determines their position deviation from the target position. The Vision Sensor operates in two dimensions: X and Y. X is the horizontal direction and Y the vertical direction. → see Figure 6.1 on page 19. The operating distance (distance between the rack profiles and the front panel of the sensor) must be within the working range of the sensor.

**Orientation coordinate system**

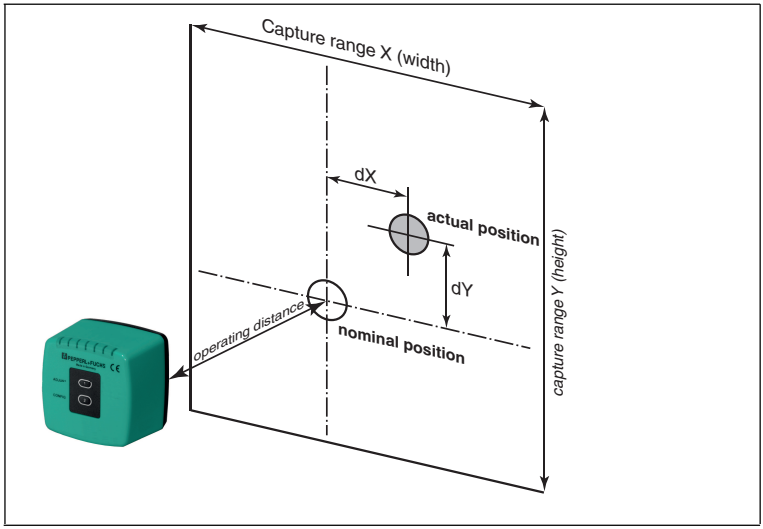


Figure 6.1

If the hole is located in the target position, a deviation zero is output.

The Vision Sensor detects dark holes on a light background. Observe the following points:

- Only one circular hole may be present in the capture range.
- All holes to be detected must have the same diameter.
- The surface surrounding the hole should only reflect diffusely.
- The area behind the hole should be unobstructed to a range of 500 mm.
- There should be no light source behind the hole.
- The Vision Sensor must be aligned parallel to the capture range.
- The actual operating distance must correspond to the operating distance of the Vision Sensor.

**Capture Range**

The capture range is the area in the camera's line of vision, within which the Vision Sensor can detect a hole.

The hole diameter should be 10 % to 15 % of the capture range width.

**Zero Position and Relative Position**

The actions to place an object (e.g., a pallet) in storage or remove an object from storage are controlled via the zero position (ZP) and relative position (RP).

You can also use the zero position to align the Vision Sensor with the hole to be detected, if a central alignment is not possible during assembly.

**Target Position**

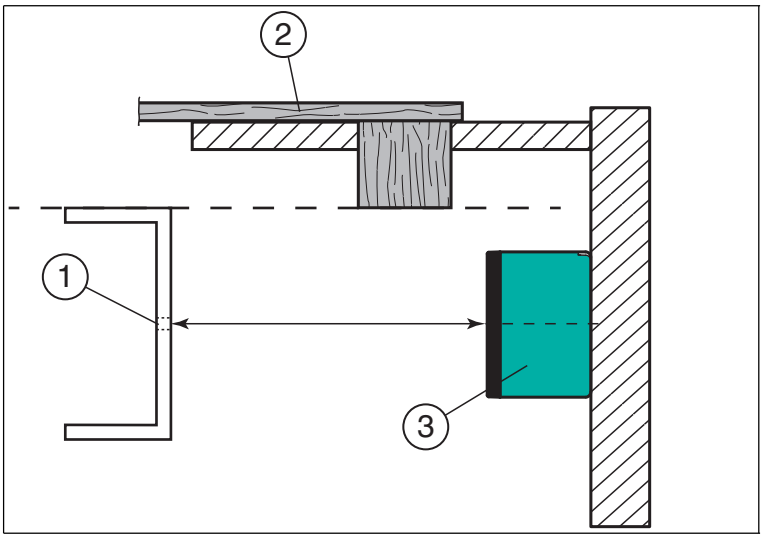


Figure 6.2

1 = index hole

2 = pallet

3 = sensor

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**Zero position (ZP)**

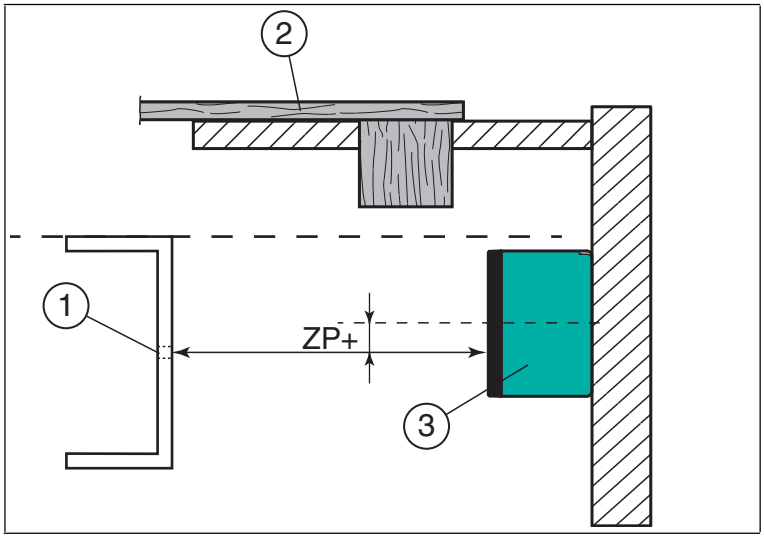


Figure 6.3

1 = index hole

2 = pallet

3 = sensor

The zero position moves the target position relative to the center point of the detection/capture range

- Downward if a positive vertical value is entered.
- To the left if a positive horizontal value is entered.

**Relative position (RP)**

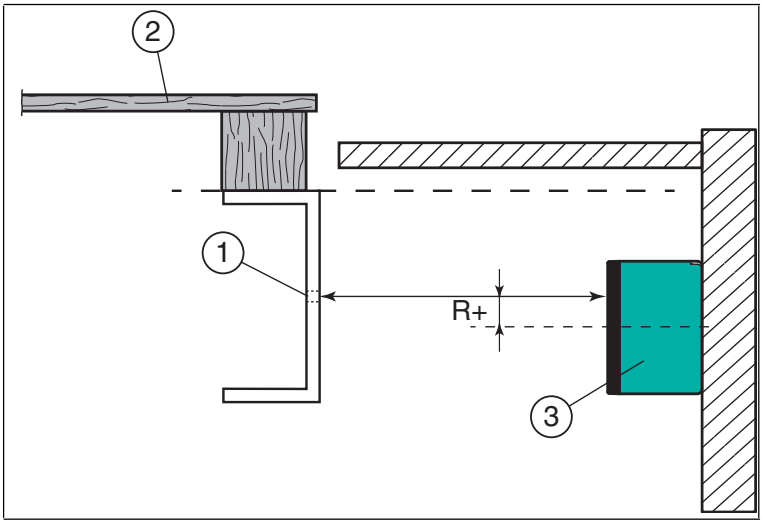


Figure 6.4

1 = index hole

2 = pallet

3 = sensor

The relative position is activated if a signal is present at input 2. The relative position moves the target position relative to the center point of the detection/capture range

- Upward if a positive vertical value is entered.
- To the right if a positive horizontal value is entered.

**Example**

You want the sensor to sit 40 mm lower when placing a pallet in storage than when removing a pallet from storage. To place the pallet in storage, a signal is sent to input 2 to activate the relative position.

**Starting position**

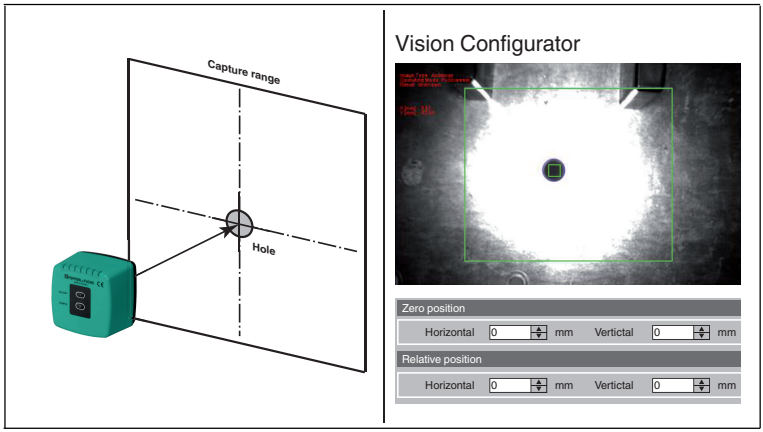


Figure 6.5

If you enter a relative position of less than 40 mm, the target position moves near to the edge of the detection/capture range during storage. At the edge of the detection/capture range, the hole can quickly shift to outside of the detection/capture range during positioning.

**Relative position RP -40 mm**

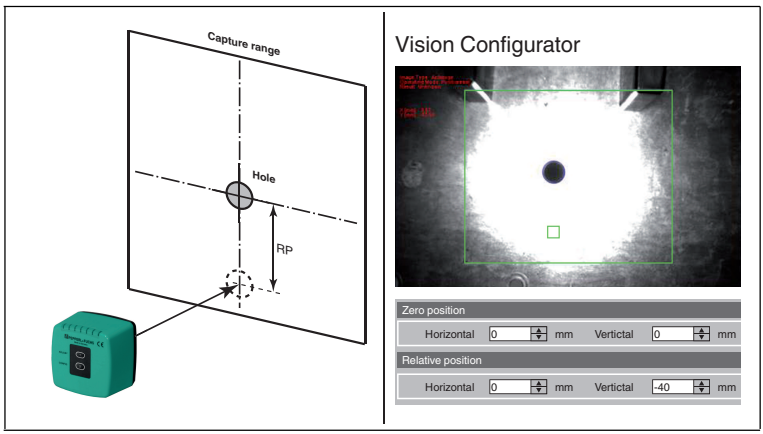


Figure 6.6

To move the hole to be detected near to the center of the detection/capture range, adjust the zero position downward by 20 mm.

**Zero position ZP -20 mm**

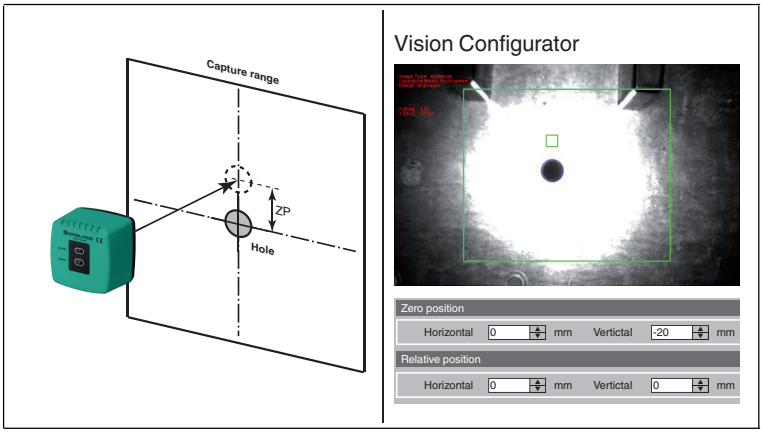


Figure 6.7

Change the relative position from -40 mm to -20 mm. If the relative position is activated by a signal being sent to input 2, the target position shifts downward by 20 mm from the center point.

**Zero position ZP -20 mm**
**Relative position RP -20 mm**

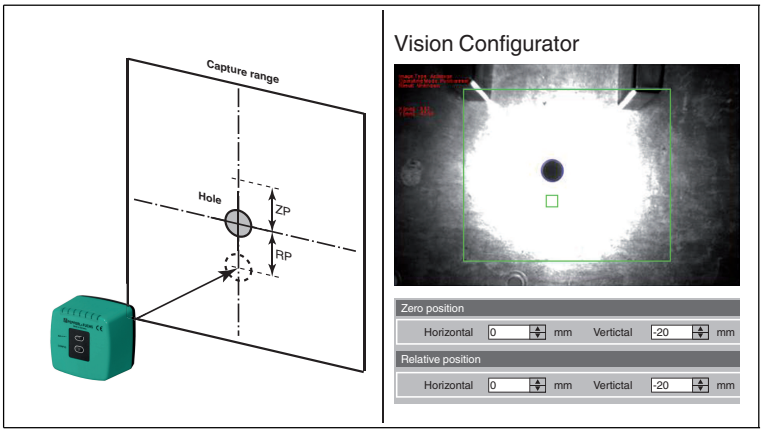


Figure 6.8

A distance of 40 mm was achieved overall. The hole to be detected is nearer to the center point of the detection/capture range.

**Tolerance Range**

The sensor provides the four digital switching outputs -X, +X, -Y, +Y as an LED display. The target position is located within a rectangular tolerance range. The switching outputs are operated as follows, depending on the X and Y deviations.

| -X | +X | | | -Y | +Y | |
|---|---|---|---|---|---|---|
| 1 | 1 | X-direction within tolerance | | 1 | 1 | Y-direction within tolerance |
| 0 | 1 | X too large | | 0 | 1 | Y too large |
| 1 | 0 | X too small | | 1 | 0 | Y too small |

The digital outputs assume the following states, depending on the quadrant of the sensor capture range in which the hole to be detected is located.

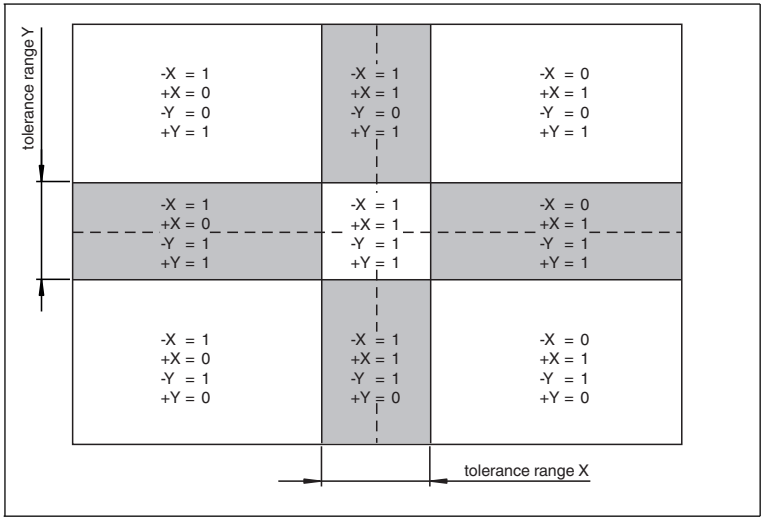


Figure 6.9 Tolerance range, as seen from the vision sensor

## 6.2 Operating Modes

The sensor has two operating modes:

- Setup
- Automatic

In setup mode, the sensor parameterization can be changed and diagnostic functions called up. The sensor is always in automatic mode once the operating voltage has been applied.

## 6.3 Communication via the RS-422 Interface

During operation, the controller and reader communicate via ASCII telegrams and the RS422 interface. The cabling is terminated as standard (220 Ohm). The software can be used to configure this standard setting, as well as the standard address 0 (0...7), and the baud rate, which is preconfigured to 115,200 bps (9600 bps, 19,200 bps, 38,400 bps, 57,600 bps, 115,200 bps, 230,400 bps).

As with RS485, when using RS422 there is a distinction between request telegrams, which the controller sends to the reader, and response telegrams in the opposite direction. Each byte of a request or response telegram consists of 9 bits (8 data bits + 1 parity bit). The parity is even.

## 6.4 Request Telegrams

Sensor request telegrams always consist of 2 bytes. The second byte corresponds to the first byte, however the 8 data bits of the first byte are inverted.

**Structure of a sensor request telegram**

| | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Byte 1 | Parity | R/W | Req.3 | Req.2 | Req.1 | Req.0 | A2 | A1 | A0 |
| Byte 2 | Parity | ~R/W | ~Req.3 | ~Req.2 | ~Req.1 | ~Req.0 | ~A2 | ~A1 | ~A0 |

Data request telegrams appear as follows:

**Structure of a data request telegram**

| | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Byte 1 | Parity | 1 | 0 | 0 | 1 | 0 | A2 | A1 | A0 |
| Byte 2 | Parity | 0 | 1 | 1 | 0 | 1 | ~A2 | ~A1 | ~A0 |

**Meaning of bits**

| Bit | Meaning |
|---|---|
| Parity | Even |
| R/W | 0=response, 1=request |
| Req. | Request command: "0010" read X/Y position and Z distance |
| A0-A2 | Sensor address |

In **continuous mode**, no data request is necessary as data is sent continuously and without request. Nevertheless, the data request also works in continuous mode. Sending a data request can be used to verify the connection. The sensor will respond in this case but will always return the last result prior to disconnection.

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The bit assignment is as follows:

**Data request disconnected (cycle stop on)**

| | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Byte 1 | Parity | 1 | 1 | 0 | 1 | 0 | A2 | A1 | A0 |
| Byte 2 | Parity | 0 | 0 | 1 | 0 | 1 | ~A2 | ~A1 | ~A0 |

**Data request connected (cycle stop off)**

| | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Byte 1 | Parity | 1 | 1 | 0 | 1 | 1 | A2 | A1 | A0 |
| Byte 2 | Parity | 0 | 0 | 1 | 0 | 0 | ~A2 | ~A1 | ~A0 |

## 6.5 Response Telegrams

**Structure of a response telegram**

| | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|---|---|
| Byte 1 | Parity | 0 | A2 | A1 | A0 | - | Warning | No Pos. | Error |
| Byte 2 | Parity | 0 | - | - | - | X +/- | XP23 | XP22 | XP21 |
| Byte 3 | Parity | 0 | XP20 | XP19 | XP18 | XP17 | XP16 | XP15 | XP14 |
| Byte 4 | Parity | 0 | XP13 | XP12 | XP11 | XP10 | XP9 | XP8 | XP7 |
| Byte 5 | Parity | 0 | XP6 | XP5 | XP4 | XP3 | XP2 | XP1 | XP0 |
| Byte 6 | Parity | 0 | - | - | - | Y +/- | YP23 | YP22 | YP21 |
| Byte 7 | Parity | 0 | YP20 | YP19 | YP18 | YP17 | YP16 | YP15 | YP14 |
| Byte 8 | Parity | 0 | YP13 | YP12 | YP11 | YP10 | YP9 | YP8 | YP7 |
| Byte 9 | Parity | 0 | -YP6 | YP5 | YP4 | YP3 | YP2 | YP1 | YP0 |
| Byte 10 | Parity | 0 | - | - | - | 0 | ZP23 | ZP22 | ZP21 |
| Byte 11 | Parity | 0 | ZP20 | ZP19 | ZP18 | ZP17 | ZP16 | ZP15 | ZP14 |
| Byte 12 | Parity | 0 | ZP13 | ZP12 | ZP11 | ZP10 | ZP9 | ZP8 | ZP7 |
| Byte 13 | Parity | 0 | ZP6 | ZP5 | ZP4 | ZP3 | ZP2 | ZP1 | ZP0 |
| Byte 14 | Parity | 0 | CNT6 | CNT5 | CNT4 | CNT3 | CNT2 | CNT1 | CNT0 |
| Byte 15 | Parity | 0 | WRN6/ ERR6 | WRN5/ ERR5 | WRN4/ ERR4 | WRN3/ ERR3 | WRN2/ ERR2 | WRN1/ ERR1 | WRN0/ ERR0 |
| Byte 16 | Parity | XOR Bit7 | XOR Bit6 | XOR Bit5 | XOR Bit4 | XOR Bit3 | XOR Bit2 | XOR Bit1 | XOR Bit0 |
| Byte 17 | Parity | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |

**Meaning of Bits**

| | |
|---|---|
| Parity | Even |
| A0-A2 | Sensor address |
| Warning | Warning detected |
| No Pos. | No drill hole found |
| Error | Error detected |
| X +/- | Sign bit for X: 0=positive, 1=negative |
| XP | X position in µm |
| Y +/- | Sign bit for Y: 0=positive, 1=negative |
| YP | Y position in µm |
| ZP | Distance in mm |
| CNT | Counter 0...99 |
| WRN/ERR | Warning/error code |
| XOR | XOR value |
| Byte17 | Fixed pattern 0xAA, not part of XOR |

## 6.6 Warning and Error Codes

**Meaning of Bits**

| Bit no. | Name | Error | Warning |
|---|---|---|---|
| Bit 0 | Timeout | Timeout parameter exceeded | Timeout more than 90 % reached |
| Bit 1 | Contour | Contour limit parameter not reached | 10 away from reaching lower limit |
| Bit 2 | Shape | Shape limit parameter not reached | 10 away from reaching lower limit |
| Bit 3 | Exposure Time | Light intensity below limit value | Light intensity in threshold range |
| Bit 4 | Trials | Number > 5 | Number > 3 |
| Bit 5 | Drill size | Hole size parameter outside of tolerance | Tolerance 1 mm from being reached |
| Bit 6 | Reserved | - | - |

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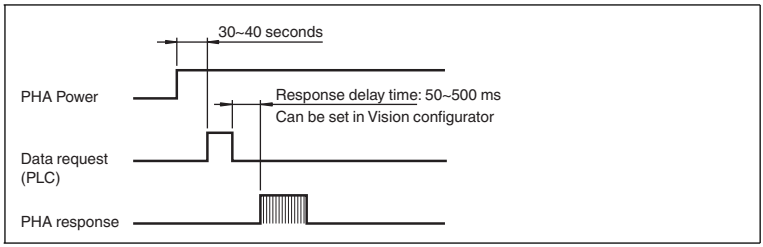
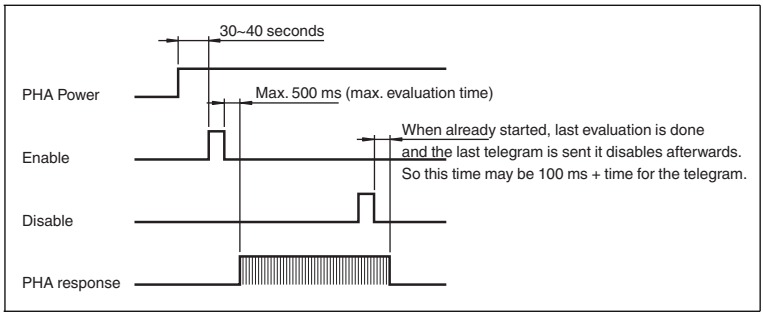
| Bit no. | Name | Description | Cause |
|---|---|---|---|
| Bit 0 | Timeout | Evaluation time has exceeded upper limit | Severely dented metal, hole not visible, plus all causes listed below |
| Bit 1 | Contour | Contour value of hole is bad | Bad drilling, dirty metal |
| Bit 2 | Shape | Shape value of bore is bad | Square hole |
| Bit 3 | Exposure Time | Brightness not adjustable | Bad contrast, LED failure, sensor window dirty, no object in front of sensor |
| Bit 4 | Trials | Number of tests with different brightness | No hole visible, bad drilling, backlight, optical defect in PHA, sensor window dirty |
| Bit 5 | Drill size | Discrepancy between predefined size of hole and measured size of hole | Wrong distance, wrong hole size, bad drilling |
| Bit 6 | Reserved | - | - |

## 6.7 Timing Charts

**Single Mode:**




**Kontinuierlicher Modus:**



# 7 Operation

## 7.1 PHA* Vision Configurator Menu Structure

### 7.1.1 Connecting the Service Interface

#### Establishing a local connection

To connect the LAN service interface to a PC, proceed as follows:

1. Use a network cable that has an RJ45 network connector on one side and a 4-pin M12 plug on the other. Insert the M12 connector into the **LAN** socket on the side of the Vision Sensor. .
2. When delivered, the sensor has the fixed IP address **192.168.2.3**. To facilitate communication with the PC, you must configure your network. You can find the configuration data in the network configuration overview.

#### Resetting the IP Address

If you do not know the IP address of the sensor, you can reset the IP address to the factory default setting.

1. Connect the sensor to the power supply.

   ↳ The sensor powers up.
2. Wait until the LEDs flash.
3. Hold down buttons **1** and **2** on the back of the sensor simultaneously for approx. two seconds.

   ↳ The LED flash sequence changes.
   The sensor powers up again and now uses the factory default IP address.

***Note!***

***Documenting the network configuration***

The sensor can communicate with the PC using the TCP/IP protocol. To ensure proper communication, you must record all the changes made to the network configuration.

***Note!***

***Cabling***

Use a crossover network cable to connect the sensor directly to a PC.

### 7.1.2 Structure of the Application Window

The application screen opens after you log in.

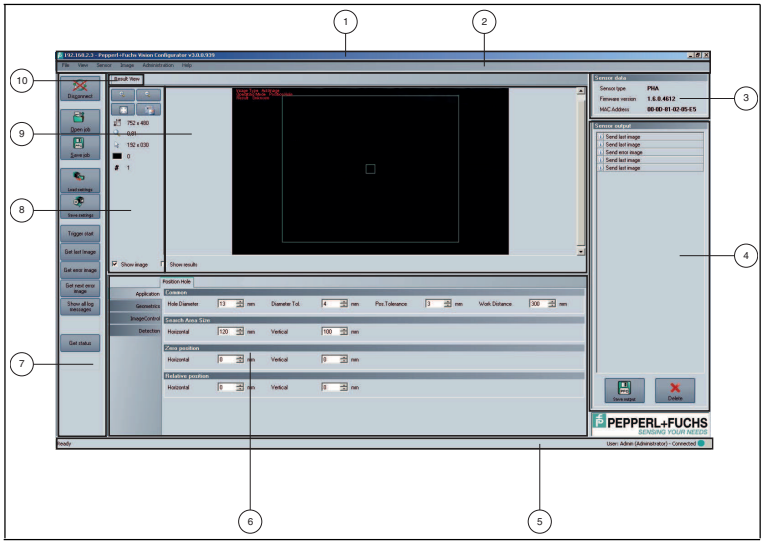



Figure 7.1 The application screen - default user

The software is designed to be similar to most Windows applications.

| No. | Designation | Function |
|---|---|---|
| 1 | Title bar | ■ Displays the software designation<br>■ Contains the **Minimize/Maximize/Close** buttons |
| 2 | Menu bar | ■ Displays all the menus in the program<br>■ Provides an overview and helps with navigation |
| 3 | **Sensor data** window | ■ Displays data of the connected sensor |
| 4 | **Sensor output** window | ■ Displays the sensor's last outputs |
| 5 | Status bar | ■ Displays status information about the application |

| No. | Designation | Function |
|---|---|---|
| 6 | Configuration Window | ■ Contains the sensor-specific parameters that you can enter |
| 7 | Toolbar | ■ Contains icon buttons as an extension to the menu |
| 8 | Results area | ■ Displays results from the sensor<br>■ A varying number of tabs can be displayed depending on which sensor is connected.<br>■ Typical tabs are:<br>"Image View" — shows images from the sensor that may contain additional information<br>"Result View" — shows measurement data or statistics<br>"Diagram View" — shows a diagram of the measurement data |
| 9 | Image display | ■ Displays images or diagrams |
| 10 | Tab | ■ Used for layout and arrangement of information<br>■ The tab in the foreground is the active one<br>■ A varying number of tabs can be displayed depending on which sensor is connected.<br>■ Typical tabs are:<br>"Image View" — shows images from the sensor that may contain additional information<br>"Result View" — shows measurement data or statistics<br>"Diagram View" — shows a diagram of the measurement data |

### 7.1.3 Menu Bar

The menu bar contains a list of menu items. The functionality depends on the type of sensor that is connected and the permissions of the user logged in.


Figure 7.2 Menu Bar

### 7.1.4 Configuration Window

Various parameters are specified in the configuration window. The individual parameters depend on the current authorization level and not all parameters are always visible. Depending on the parameters set, some fields will be grayed out.

**Configuration Window *Position Hole* Menu Item *Application***

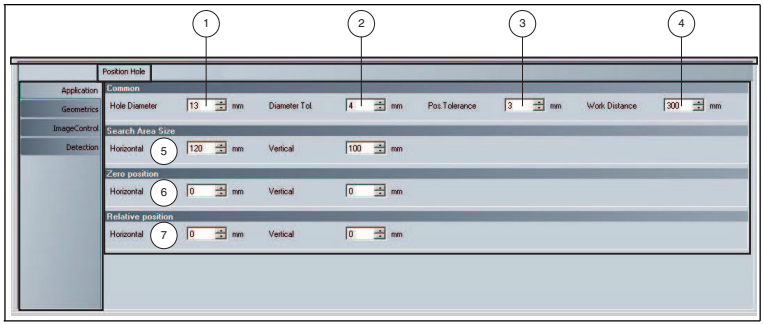



Figure 7.3 Configuration Window **General Tab — Common**

| No. | Designation | Function |
|---|---|---|
| 1 | Hole Diameter | In the "Hole Diameter" field, you can set the hole diameter of the circular holes to be detected.<br>■ The larger the hole diameter, the easier detection is. |
| 2 | Diameter Tol. | In the "Diameter Tol." field, you can set the tolerance range for the diameter. Within this tolerance range, holes are still detected as good.<br>■ The measured hole diameter varies according to fluctuations in the operating distance. |
| 3 | Pos. Tolerance | In the "Pos. Tolerance" field, you can set the tolerance range for the position. Within this tolerance range, the position of a hole is still detected as well. |
| 4 | Work Distance | In the "Work Distance" field, you can set the operating distance for the Vision Sensor.<br>■ The set operating distance must match the operating distance of the Vision Sensor.<br>■ The correct operating distance is important for calculating the hole diameter. |
| 5 | Search Area Size | In the "Search Area Size" field, you can set the horizontal and vertical dimensions for the capture range. |

| No. | Designation | Function |
|---|---|---|
| 6 | Zero Position | In the "Zero Position" field, you can set the horizontal and vertical shift for the target position relative to the center point. |
| 7 | Relative Position | In the "Relative Position" field, you can set the horizontal and vertical relative position relative to the center point. The relative position only shifts the target position if input 2 (IN 2) is activated. See "Zero Position and Relative Position" on page 20. |

# 8 Maintenance and Repair

## 8.1 Maintenance

The cable is maintenance-free. To get the best possible performance out of your device, keep the optical unit on the device clean and clean it when necessary.

Observe the following instructions when cleaning:

- Do not touch the optical unit with your fingers.
- Do not immerse the device in water. Do not spray the device with water or other fluids.
- Do not use a scouring agent to clean the surface of the device.
- Use a cotton or paper cloth moistened with water or isopropyl alcohol (not soaked).
- Remove any residual alcohol using a cotton or paper cloth moistened with distilled water (not soaked).
- Wipe the device surfaces dry using a lint-free cloth.

## 8.2 Repair

The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.

# 9 Troubleshooting

## 9.1 What to Do in the Event of an Error

Before you have the device repaired, take the following actions:

- Test the equipment according to the checklist below.
- Contact our Service Center in order to localize the problem.

**Checklist**

| Fault | Cause | Remedy |
|---|---|---|
| "PWR" LED does not light up | The power supply is switched off. | Check whether there is a reason why the power supply is switched off (installation or maintenance work, etc.). Switch on the power supply if appropriate. |
| "PWR" LED does not light up | Wiring fault in the splitter or control cabinet, cable break | Check the wiring carefully and repair any wiring faults. Check the cable to ensure proper function. |
| No connection to the device | Network cable not connected | Connect the network cable. |
| No connection to the device | Wrong network cable used | Direct connection between PC and device: use a crossover network cable.<br>Connection via an existing network: use a twisted-pair network cable. |
| No connection to the device | Wrong network IP used | Check the entry for the network IP and ensure that you have entered the correct IP for the sensor. |

- If none of the above remedies corrects the problem, please contact our Service Center. Please have the fault patterns and the version number of the firmware available. The firmware version number can be found at the top right of the user interface.

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