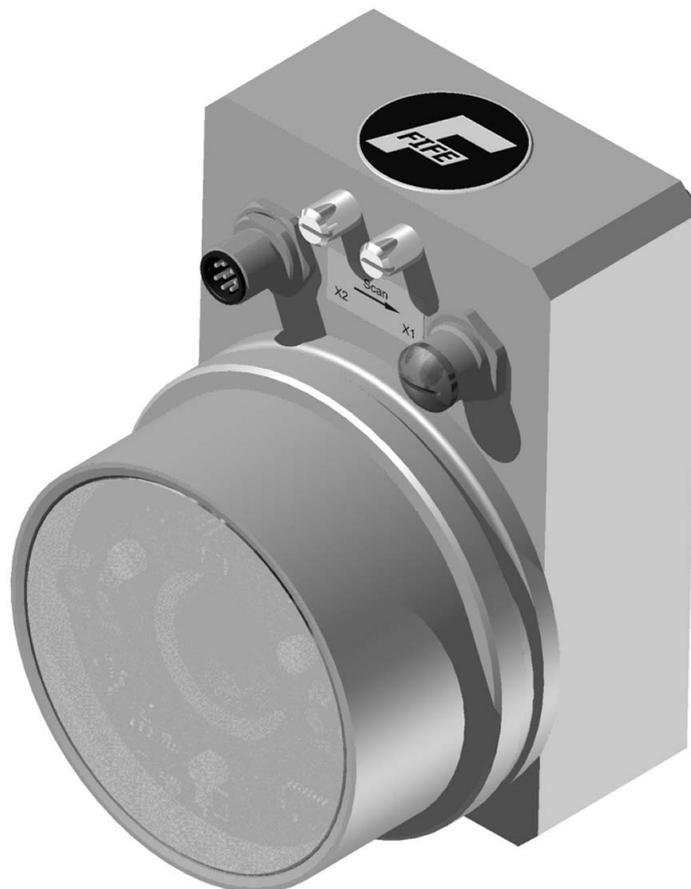


GB

## DAC-005 Operating Instructions

Diode line camera

Application:  
Recognition of web edges



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# 1 INTRODUCTION

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## About these operating instructions

These operating instructions are designed to facilitate commissioning, operation and maintenance of the DAC-005 diode line camera and provide important information for correct use of the system.

These operating instructions are intended for both the system constructor as well as the operator who uses the DAC-005 diode line camera in production. They must be read and used by all persons who are responsible for installing, operating and maintaining the DAC-005 diode line camera.

The operating instructions must be carefully stored and must always be available throughout the service life of the DAC-005 diode line camera.

### Translation of the original Operating Manual:

This Operating Manual is a translation. The original Operating Manual was composed in German.



### Note:

These operating instructions use the term web for purposes of simplification. The term may be used to refer to a material web in the paper or sheet processing industries, for example, or to a strip in the steel industry.

---

## Intended use

The DAC-005 diode line camera is used to record material web edges. In combination with a Fife-Tidland GmbH web guide controller, the DAC-005 is suitable for

- Web edge guiding,
- Web centre guiding and
- Width measurement.

Multiple cameras can carry out these tasks in combination.

The DAC-005 diode line camera can be used to monitor both opaque and partially transparent material. Applications can be implemented whereby light passes through or simply strikes a surface.

The DAC-005 camera must not be used in explosive areas.

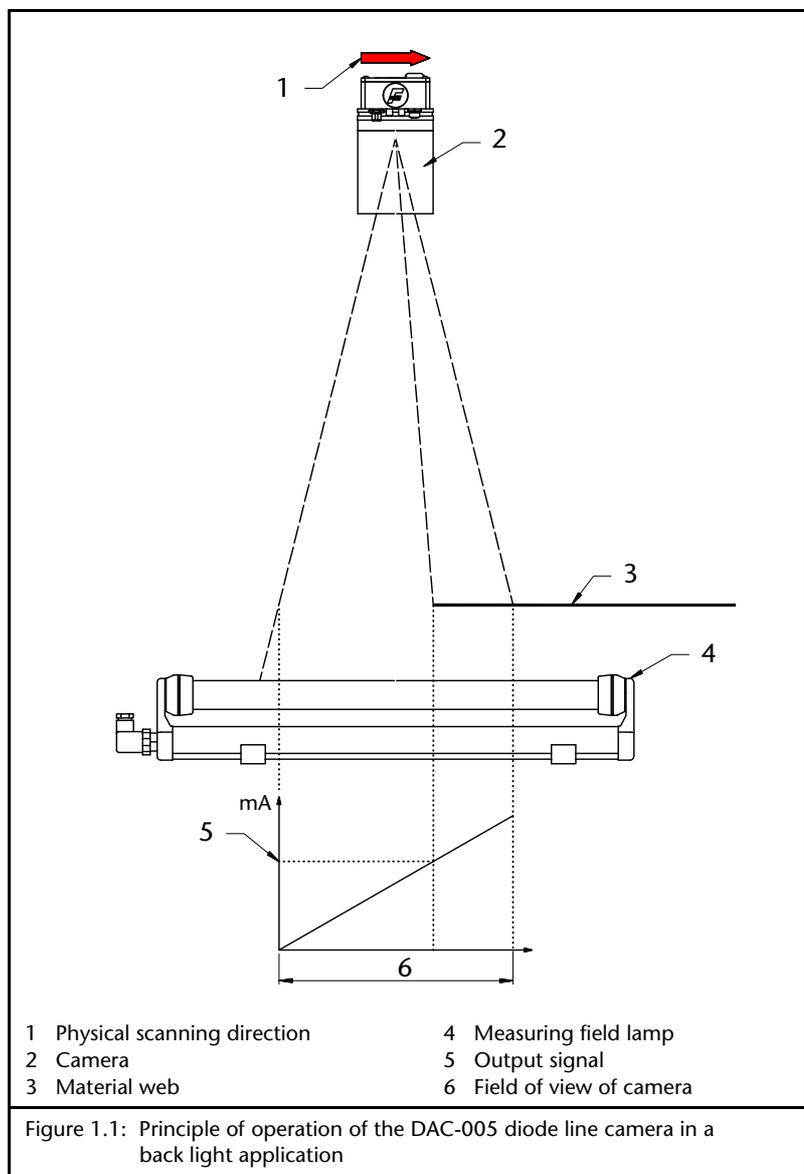


Note:

The DAC-005 diode line camera may not be opened. If the DAC-005 diode line camera is opened, no claims will be honoured under the warranty.

**Function**

The functionality is explained based on a back light application (see [Figure 1.1](#)).



The camera (2) is mounted above a light source (4). The measuring field lamp is connected to a high-frequency ballast. The high frequency (approximately 30kHz) guarantees a camera signal free of interference. The camera must be aligned so that light falls onto

all photodiodes. If part of the measuring field lamp is covered over by the material web (3), a corresponding number of photodiodes will cease to be exposed and the analogue output signal (5) will change proportionately to the number of shaded diodes.

### Operation



The camera is operated entirely via a D-MAX OI-B or OI-N operator interface, or via a PC-based virtual OI.

The OI-S operator interface serves as a status display and can also be used to align the camera mechanically and optically.

### Option

The version with the C mounted lens has an internal light source (10 - [Figure 1.2](#)) optionally available for illumination of the web. This light source can illuminate the web with one of the three colours

- Red,
- Green or
- Blue.

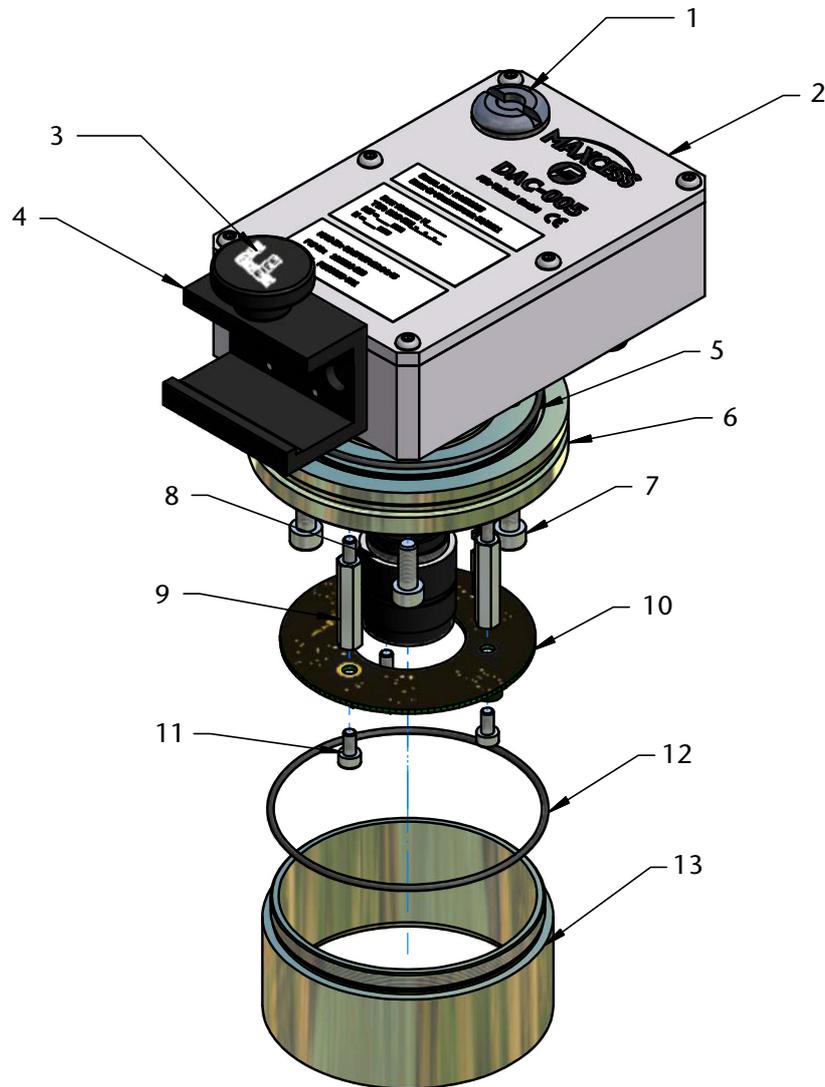
---

### Layout of the DAC-005

The DAC-005 diode line camera comprises essentially the camera housing, the lens and the protective tube. The camera housing contains a CCD chip with 5150 light-sensitive diodes (photodiodes). These photodiodes are arranged one after another in a row or line, hence the name diode line camera. A photodiode is designated as a pixel. As in a photographic camera, the lens is used to adjust the focal length, aperture and distance.

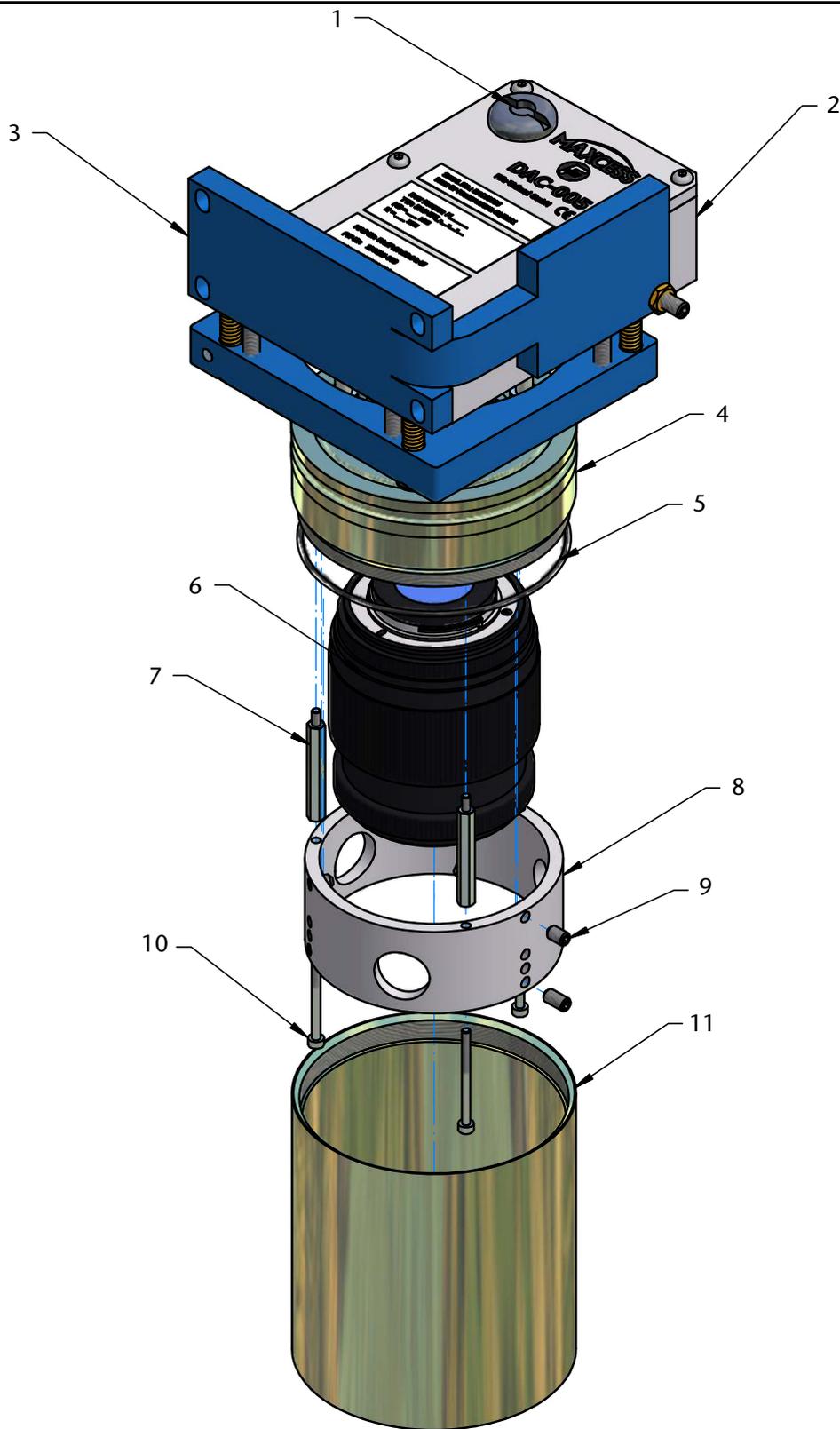
Two different types of lenses can be selected for the camera:

- C mount (see [Figure 1.2](#)) and
- F mount (see [Figure 1.3](#)).



- |   |                     |    |                              |
|---|---------------------|----|------------------------------|
| 1 | Desiccant cartridge | 8  | Lens                         |
| 2 | Camera              | 9  | Distance bolts               |
| 3 | Star grip screw     | 10 | Lighting assembly (optional) |
| 4 | Mounting bracket    | 11 | Screw                        |
| 5 | O ring              | 12 | O ring                       |
| 6 | Lens plate          | 13 | Protective tube              |
| 7 | Screw               |    |                              |

Figure 1.2: Layout of diode line camera with C mount lens



- |                       |                    |
|-----------------------|--------------------|
| 1 Desiccant cartridge | 7 Distance bolts   |
| 2 Camera              | 8 Locking ring     |
| 3 Fine adjustment     | 9 Clamping screw   |
| 4 Lens plate          | 10 Screw           |
| 5 O ring              | 11 Protective tube |
| 6 Lens                |                    |

Figure 1.3: Layout of diode line camera with F mount lens

---

## Terminology and functions

### Symbols used



This arrow denotes the physical scanning direction and is located on the front of the camera.



This arrow denotes the virtual scanning direction and is located on the operator interface display.



This arrow is located on the customer drawing and denotes the recommended direction for the edge search.

### Field of view

The field of view denotes the area that is detected by the camera in the level of the material web (see [Page 1-2](#)).

The field of view, and thus the resolution of the camera, depends on the distance from the camera to the material web.

If a zoom lens (F mount) is used, the field of view can be changed without changing the distance.

Short focal lengths (for example 35 mm, which corresponds to a wide-angle lens) produce a larger field of view. Long focal lengths (for example 210 mm, which corresponds to a telephoto lens) produce a relatively smaller field of view.

A customer drawing is created for each application. This drawing contains the following data:

- H Distance camera - material web,
- HL Distance camera - measuring field lamp,
- MB field of view (focal width)
- Physical scanning direction
- Direction of the edge search

### Aperture and exposure time

The photodiodes require a certain amount of light (intensity). The amount of light can be altered with the aperture and exposure time. If the aperture opening is enlarged (low aperture index, for example 5.6), more light is able to reach the diodes. If too much light is allowed to enter, the camera signal is overshot. A long exposure time has the same effect. The settings for the aperture and the exposure time are mutually dependent.

The camera is equipped with an automatic exposure mechanism with a time extending from 0.9ms to 20ms. When setting

manually, exposure times up to a maximum of 50ms are possible. For controlling with a Fife-Tidland GmbH web guide controller, the exposure time should be under 20ms.

**Material web edge**

A bright-to-dark or dark-to-bright transition on the photodiodes is evaluated by the camera as a material web edge. It makes no difference whether the camera detects the bright measuring field lamp and then the dark material web or vice-versa. The DAC-005 camera can evaluate multiple material web edges in the configuration given here.

**Scanning direction**

A distinction is made between the physical and virtual scanning direction.

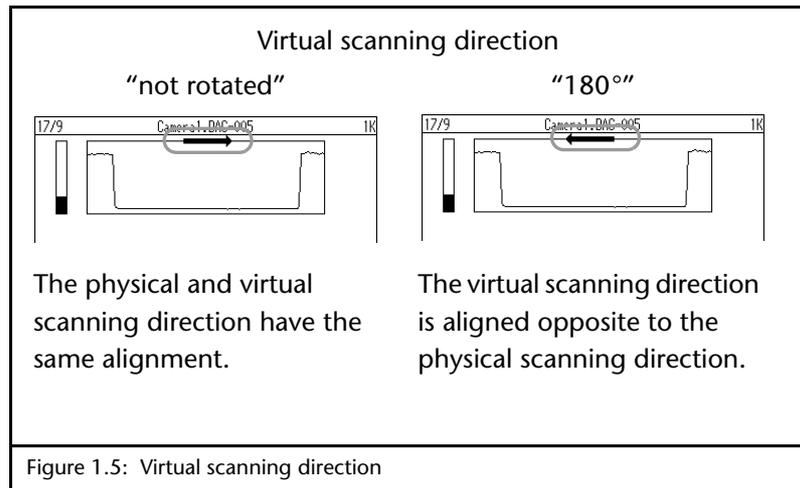


**Physical scanning direction**

The physical scanning direction (1) of the camera is indicated by an arrow on the front of the camera housing (see [Figure 1.4](#)).

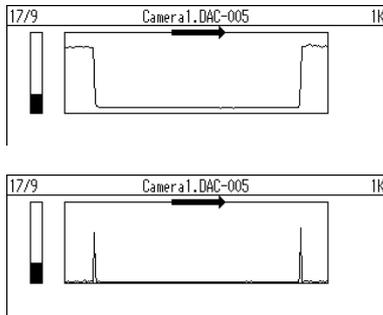
**Virtual scanning direction**

The virtual scanning direction describes the direction of the internal signal processing in the camera. This scanning direction can be turned through 180° electronically by configuring a menu setting (see [Menu 1y.4.6 Rotate mounting direction virtually, page 7-23](#)).



## Video signal

In order to adjust the camera, the video signal must be viewed on an oscilloscope. The camera outputs two different signals, which help detect an edge:



- A brightness signal and its differentiated form
- A contrast signal.

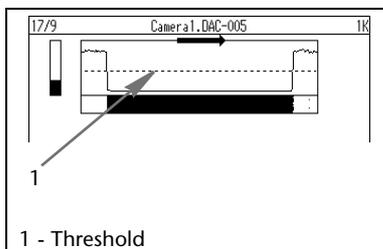
Both signals represent the same information but in different ways.

## Filter

A signal filter is used to form the signals. The signal quality can be influenced with the aid of this filter. Edges displaying strong noise can, for example, be smoothed. The signal amplitude of the contrast signal depends on the size of the filter. The size of the filter is set in pixels.

## Threshold

The threshold defines which exposure level defines the photodiodes as being light or dark.



When opaque web material is being scanned, the difference between the bright measurement field light and the dark material is very pronounced. The threshold of the brightness signal can be set to half way between the bright and the dark level.

This also applies to the contrast signal.

When transparent material is being scanned, the difference between the light level and the dark level depends on how transparent the material is. The threshold setting must be adjusted.

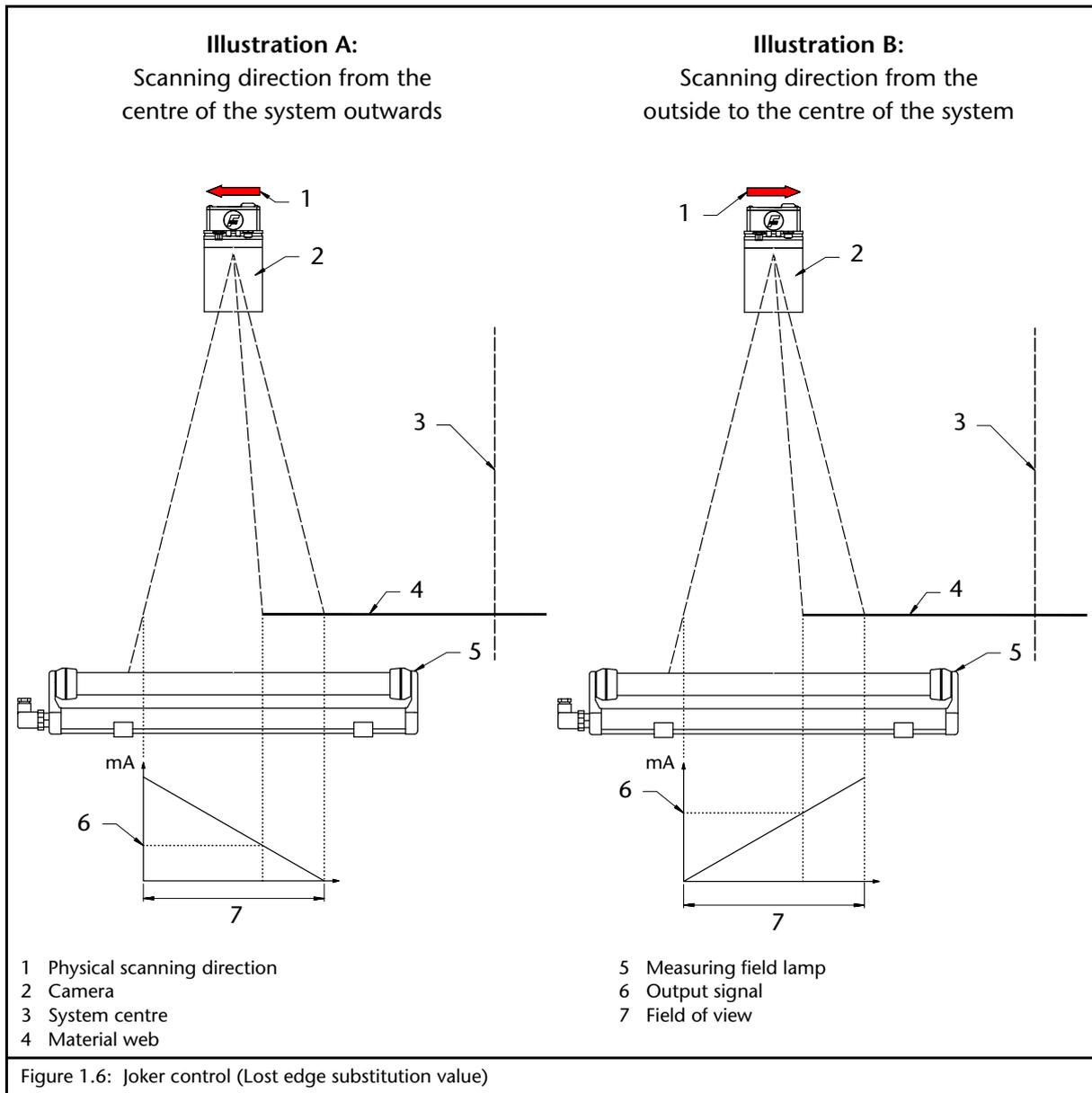
Selecting the appropriate threshold also depends on the ambient conditions. Extraneous reflection on the material web has only a minor effect if a higher threshold is selected. If the measuring field lamp is dirty, it is better to set a lower signal level.

## Joker: Lost edge substitution value

If the camera does not detect an edge, it may be because it is located too far to the right or left, out of the camera's field of view. The camera is unable to distinguish these two cases. Because of

this, a definition must be set for the analogue output signal. This is done by means of joker control.

Joker control is only available for the brightness signal, since here the evaluation threshold can be used to determine whether or not the material is in the field of view.



In principle, three cases can be distinguished.

**1. Scanning direction from the centre of the system outward:**

The scanning direction is orientated from the inside toward the outside (the reference point is the centre of the system - see illustration A in [Figure 1.6](#)). If a piece of test material is now moved from the centre of the system outward into the field of view, the

analogue signal will increase continuously from its initial value of 0mA (max. value 10mA). Joker control must be marked so that the analogue signal of the camera is 0 mA with no web.

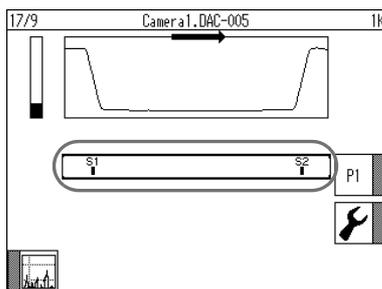
**2. Scanning direction from the outside to the centre of the system:**

The scanning direction is oriented from the outside toward the inside (the reference point is the centre of the system - see illustration B in *Figure 1.6*). If a piece of test material is now moved from the centre of the system outward into the field of view, the analogue signal will decrease continuously from its initial value of 10mA. Joker control must be marked so that the analogue signal of the camera is 10 mA with no web.

**3. The last valid position is retained:**

For both of the cases above, the last valid position can be output.

**Signals**



The information recorded by the DAC-005 camera is processed and combined into Sx signals. These signals form the source for the output signals.

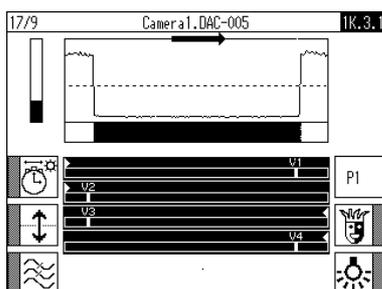
Signals S1 and S2 are available as standard. These signals are provided via two analogue outputs.

The signals are shown in one channel in the DAC-005 camera display.

For special applications, up to four signals, S1 to S4, can be output. However, customer-specific software is required for this. Two of the signals are then available at the analogue outputs and all four signals are transmitted via MAXNET.

**Virtual sensors**

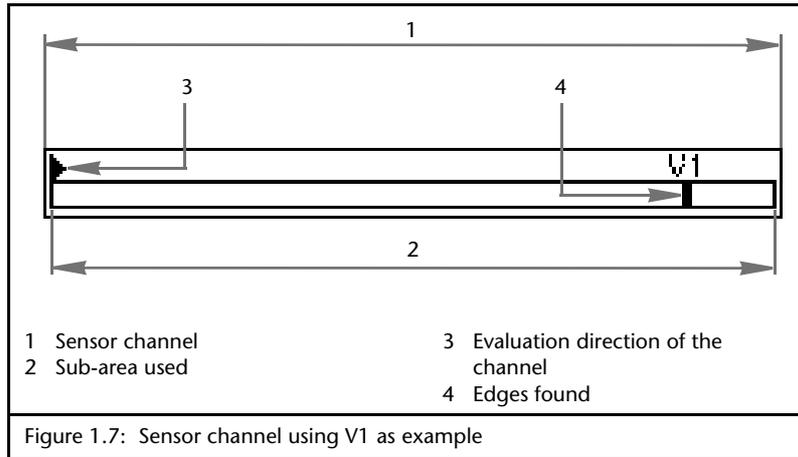
The field of view of the DAC-005 camera can be split up into a maximum of 31 different sub-areas. These sub-areas are named virtual sensors V1 to V31.



A virtual sensor Vx is displayed in a sensor channel (*Figure 1.7*) and is defined by

- the sub-area used (2) and
- the direction of scan (3).

The camera is therefore able to detect up to 31 edges.



**Note:**  
In contrast to [Figure 1.7](#), depending on the programming of the DAC-005 camera, it is possible to show other representations of the virtual sensors in the sensor channels.

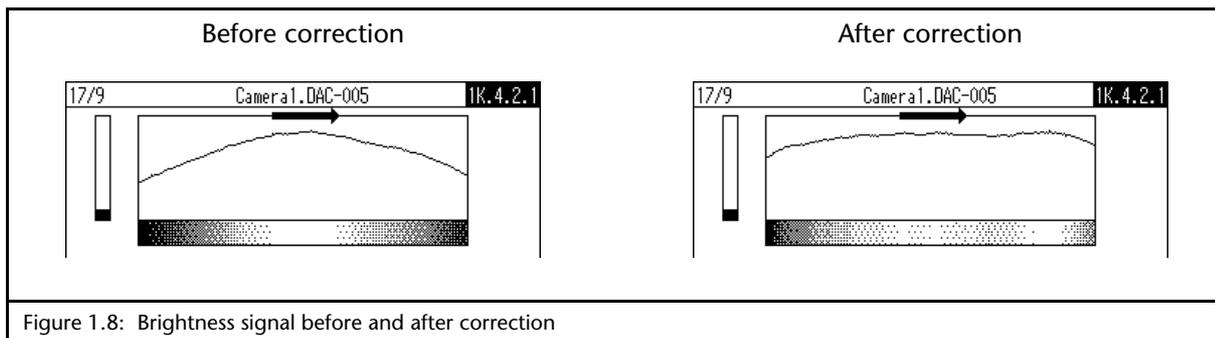
The software of the DAC-005 camera is used to define how many virtual sensors are used for an application and which ones they are (depending on the setting in [Menu 1y.3.1.6 Profile Usage and Presets, page 7-12](#)),

- as well as the characteristics of the sensors (e.g. detection of rising or falling flanks),
- and how the results of the virtual sensors are shown on the signals Sx.

The results of the 31 virtual sensors are transmitted via MAXNET.

**Brightness correction**

When the F and C mount lenses are used, the brightness signal may be non-linear. The camera offers corresponding functions to correct this non-linearity (see [Menu 1y.4.2 Brightness Correction, page 7-15](#)).



**Calibration**

Image errors occur because the lenses of the camera are not ideal or because the camera does not have an orthogonal view of the web. To compensate for these errors, the camera must be calibrated with the aid of a bar calibration gauge (see [Menu 1y.4.3 Calibration, page 7-16](#)).

Under ideal conditions, calibration can give an measurement accuracy of up to 0.02%.

In calibration, the entire geometry of the camera, including the lens, is taken into account. All subsequent changes here require recalibration.

**Camera position**

If the camera is operated in a system comprising multiple cameras, it can be assigned an absolute position. This can be calibrated with regard to the centre of the system using a gauge of known length (see [Menu 1y.4.4 Calibrate Camera Position, page 7-19](#)).

**Analogue signal**

The analogue output signal (0 to 10mA) of the camera is determined by the position of the edges in the camera field of view. If the edge is at the end of the field of view, the camera outputs a small analogue signal of almost 0mA. If the camera is at the other end of the field of view, the camera returns a large analogue signal of almost 10mA.

The camera can supply two analogue output signals. This permits two edges to be output.

**Digital signal**

The digital output signal of the camera is generated by two open collector outputs. These can be configured, for example, as alarm outputs (lamp contamination etc.).

**Ethernet interface**

The camera has a Ethernet interface. This interface transmits all relevant results from the virtual sensors and the connected sensors to the web guide controller.

---

## 2 SAFETY INSTRUCTIONS

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### Instructions for using the DAC-005 camera

Smooth and reliable operation of the DAC-005 camera requires that the system be transported, stored, installed and commissioned correctly. Proper operation and careful maintenance will ensure a long camera service life.

Only persons who are acquainted with the installation, commissioning, operation and maintenance of the system and who possess the necessary qualifications for these activities may work on the DAC-005 camera.



The following must be observed:

- The content of these Operating Instructions
- National, state and local requirements for accident prevention and environmental protection

---

### Information about safety instructions

The safety instructions and symbols described in this section are used in these Operating Instructions. Their purpose is to avoid possible dangers for users and to prevent material damage.

### Safety instructions



---

#### SIGNAL WORD:

Sources of danger and their consequences.

⇒ Avoiding dangers

---

The signal word **WARNING** refers to the danger of moderate to severe bodily harm.

The signal word **CAUTION** refers to the danger of slight to moderate bodily harm or material damage.

## Symbols



### Warning/caution — dangerous area

Reference to general hazards that may result in bodily harm or damage to the device



### Warning/caution — danger of crushing

Refers to danger of injury caused by crushing



### Warning/caution — danger of cutting

Refers to danger of injury caused by cutting



### Warning/caution — danger of temporary blindness

Refers to dangers that may be caused by being briefly dazzled.

### Additional symbols

– This en-dash is followed by an enumeration.

● This dot is followed by a prompt to do something.

1. The prompts that follow describe what to do in numbered order.



Note:

Reference to important information.

---

## Safety instructions

The following points must be observed to ensure that the DAC-005 camera works reliably.



- Avoid direct visual contact with the internal illumination of the camera. The light that is emitted is very strong and may result in temporary blindness or damage to eyes. Temporary blindness or dazzling may diminish visual capacity and cause after-images. This in turn may result in accidents in the workplace. Care must therefore be taken not to place the camera in operation until it is mechanically fastened to its intended support rod and the material web has been moved in front of the camera's field of vision.

### Installation and commissioning

- A damaged camera must not be installed or commissioned.
- All assembly tasks on the camera may only be performed when there is no electrical power in the system.
- Assembly tasks and mechanical settings must only be performed when the machine has been stopped and secured against restarting.
- The camera may only be placed in operation when securely mounted.
- Electrical connections on the camera should only be made or disconnected when there is no electrical power in the system. Failure to observe this instruction may result in damage to the camera.
- The parameters specified in the *Technical data* section must be observed.
- Only accessories and replacement parts that have been approved by Fife Tidland may be used.
- No changes may be made to the camera.

### Operation



- During operation, do not touch or move hands close to moving parts (rollers, web). There is a danger of crushing.



- There is a danger of being cut by the web edge due to the web material and/or the movement of the web itself.

- If the DAC-005 camera is damaged while in use, it must be taken out of operation.

### Maintenance

- Maintenance work must only be performed on the DAC-005 camera when the power is turned off, and the machine is stopped and secured against restarting.

## 3 DAC-005 INSTALLATION

### Safety instructions

On installation, the *Safety instructions, Page 2-1* must be observed.

### Transport and storage

- The camera must be protected against slipping during transport.
- The camera must be stored in a cool, clean, dry place.
- The camera must not be stored close to powerful magnetic fields. This may damage the electronic components.

### Scope of delivery

- DAC-005 camera:  
Measurement range information, model designation, serial number, and the firmware and software numbers can be found on the rating plates on the housing.
- Operating Instructions

### Customer drawing

A customer drawing is created for each application. This drawing contains the following data:

- H Distance from camera to material web,
- HL Distance from camera to the measuring field lamp,
- MB Field of view (focal length)
- Physical scanning direction
- Direction of the edge search

The installation is performed according to this drawing.



#### Note:

The cameras are set up and tested according to the customer drawing before they are delivered (focal length, aperture and distance). If these values are retained in the system during installation, all that remains to be done during commissioning is to check the alignment of the camera with the measuring field lamp.

### Assembly

The cameras are fastened in place with a support. In contrast to other web edge sensors, attention must also be paid to adjusting the lens and the scanning direction for diode line cameras. The scanning direction is indicated by an arrow on the camera housing (see *Figure 1.4, Page 1-7*).



**WARNING:**

⇒ All assembly tasks on the camera may only be performed when there is no electrical power in the system.

⇒ Assembly tasks and mechanical settings must only be performed when the machine has been stopped and secured against restarting.

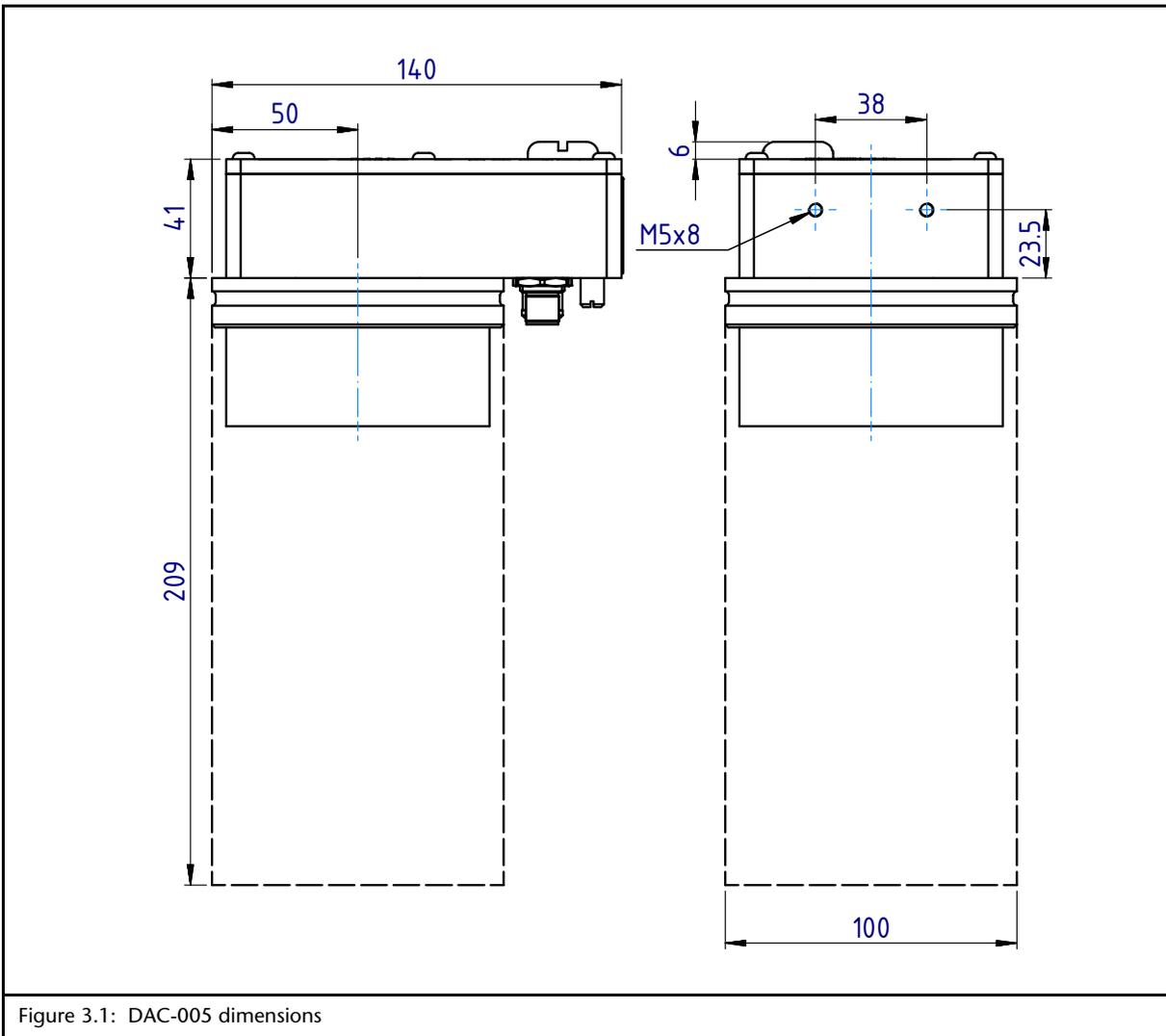


Figure 3.1: DAC-005 dimensions

## Assembly location

- Protection class: IP65
- Operating temperature: 0°C to 50°C,  
Relative humidity: up to 90% non-condensing  
Operating height above sea level: maximum 3000m
- Protect against vibration
- Keep away from strong magnetic fields:  
The electronic components may be damaged.
- Unless another arrangement is recommended, mount the camera directly behind the offset pivot guide (see also [Figure 3.2, Page 3-3](#)). The greater the distance from the camera to the offset pivot guide, the lower the guiding accuracy.
- The material web may not exhibit any radial run-out in the field of view of the camera.
- The material web must run parallel to the lower edge of the camera in the scanned area.
- On-light application:  
The viewing area on the material web should be on or just behind the support roller.
- Back light applications with external light source:  
The camera must be mounted either between two rollers or close behind one support roller.

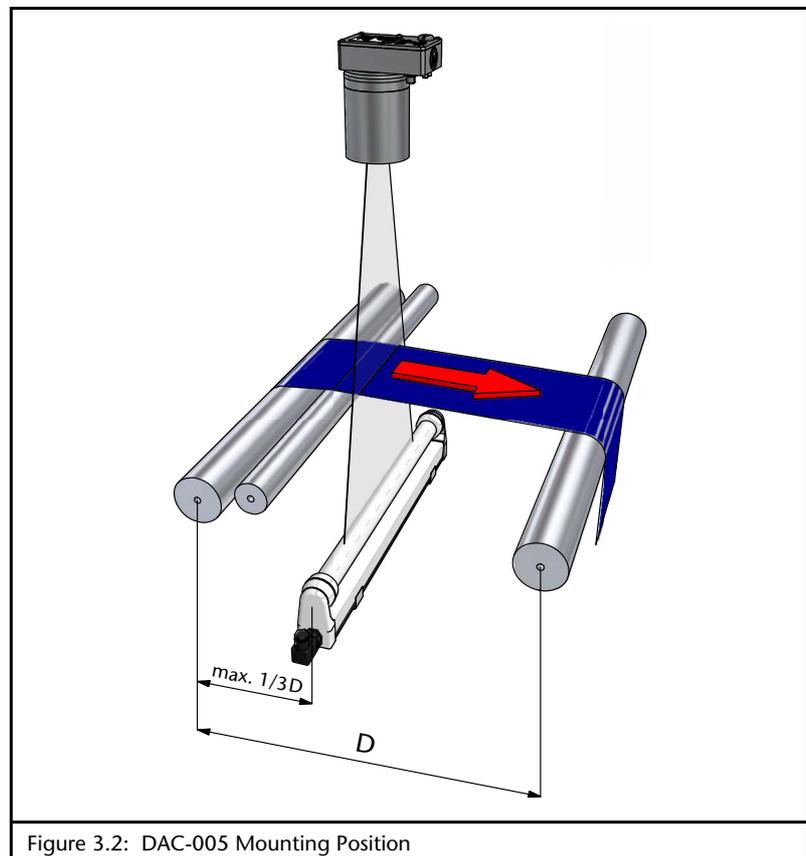
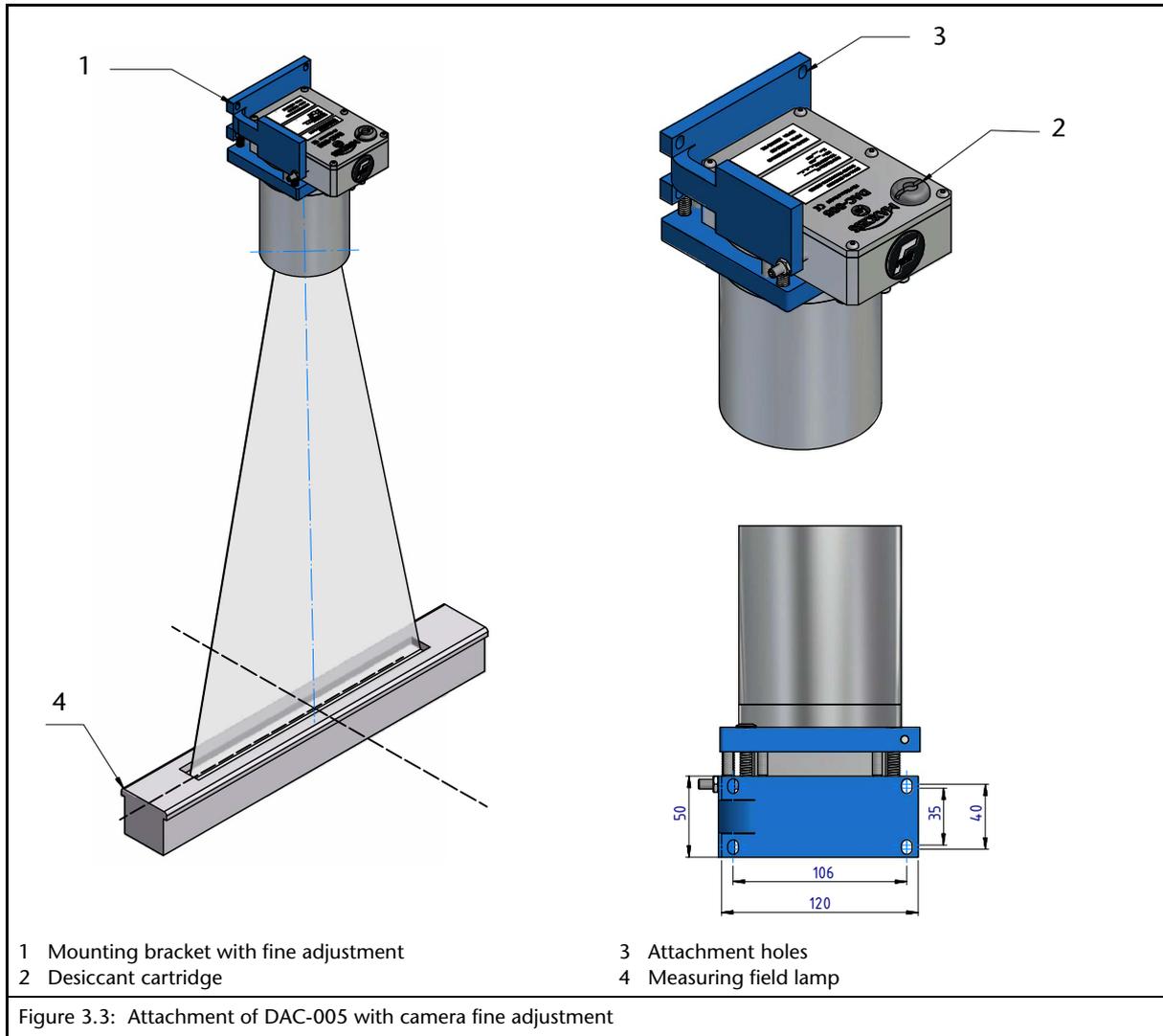


Figure 3.2: DAC-005 Mounting Position

**Attachment via mounting bracket with fine adjustment**

The fine adjustment can be used to align the camera so that the photodiode line is precisely aligned to the system and lighting (see also [Figure3.3](#) and [Figure4.2](#)).



1. Attach fine adjustment (1 - [Figure3.3](#)) with the four screws (3 - [Figure3.3](#))
2. Remove clamping screw (5 - [Figure4.2](#))
3. Place camera in the mounting bracket
4. Insert clamping screw (5 - [Figure4.2](#))
5. Connect and secure the connecting cable
6. Set up camera (see [Align camera mechanically, Page 4-2](#))
7. Secure camera with the clamping screw (5 - [Figure4.2](#))
8. Replace desiccant cartridge (2 - [Figure3.3](#)) when pink in colour

**Removal/replacement when attached to mounting bracket with fine adjustment****Note:**

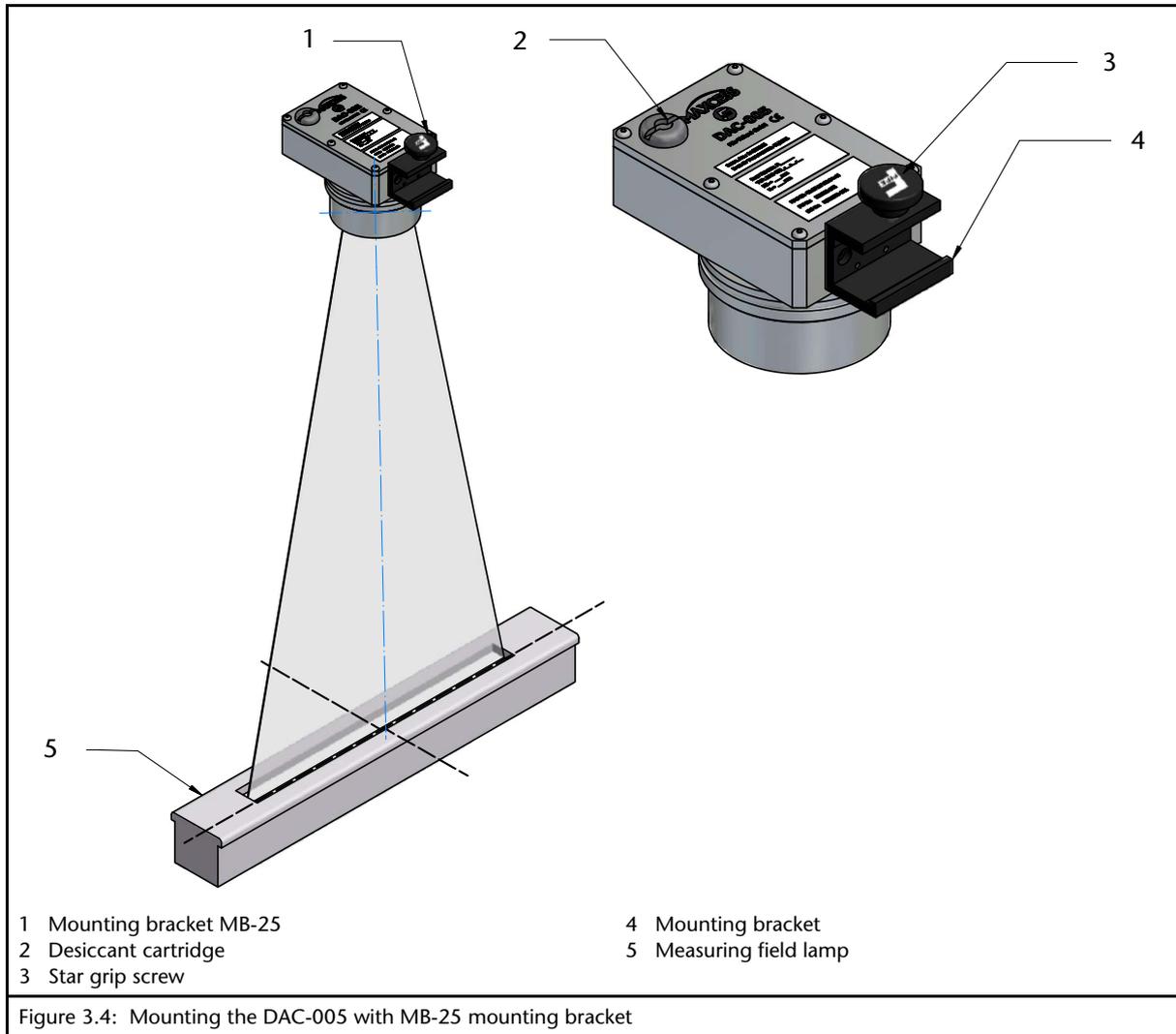
When replacing the DAC-005 camera, the settings of the screws (items 6 and 8 in [Figure 4.2, Page 4-2](#)) or the lock nut (item 7 in [Figure 4.2, Page 4-2](#)) may not be changed. These elements fix the exact position of the camera in the bracket.

1. Remove connecting cable
2. Remove clamping screw (5 - [Figure4.2](#))
3. Remove camera from the bracket
4. Place new camera in the mounting bracket
5. Insert clamping screw (5 - [Figure4.2](#))
6. Press camera against the positioning screw (6 - [Figure4.2](#)) and secure with the clamping screw
7. Connect and secure connecting cable
8. Check the mechanical alignment of the camera (see [Align camera mechanically, Page 4-2](#))
9. Replace desiccant cartridge (2 - [Figure3.3](#)) when pink in colour

**Mounting via mounting bracket without fine adjustment**

see also [Figure3.4](#):

1. Attach the mounting bracket with the two screws to the camera
2. Place mounting bracket with the camera on the rectangular bar
3. Secure camera with the star grip screw (3 - [Figure3.4](#))
4. Connect and secure the connecting cable
5. Set up camera (see [Align camera mechanically, Page 4-2](#))
6. Replace desiccant cartridge (2 - [Figure3.3](#)) when pink in colour



**Removal/replacement when attached to mounting bracket without fine adjustment**



**Note:**

Before replacement, the position of the mounting bracket on the rectangular bar should be marked.

1. Remove connecting cable
2. Loosen star grip screw (3 - [Figure3.4](#))
3. Take down mounting bracket with the camera on the rectangular bar
4. Unscrew mounting bracket and attach to the new camera
5. Place mounting bracket with the camera on the rectangular bar
6. Secure camera with the star grip screw (3 - [Figure3.4](#))

7. Connect and secure the connecting cable
8. Check the mechanical alignment of the camera and correct if necessary (see [Align camera mechanically, Page 4-2](#))
9. Replace desiccant cartridge (2 - [Figure 3.3](#)) when pink in colour

## Electrical connection



### CAUTION:

⇒ Electrical connections on the DAC-005 camera should only be made or disconnected when there is no electrical power in the system.  
Failure to observe this instruction may result in damage to the camera.

The DAC-005 diode line camera must be connected according to the system diagram in the system documentation.

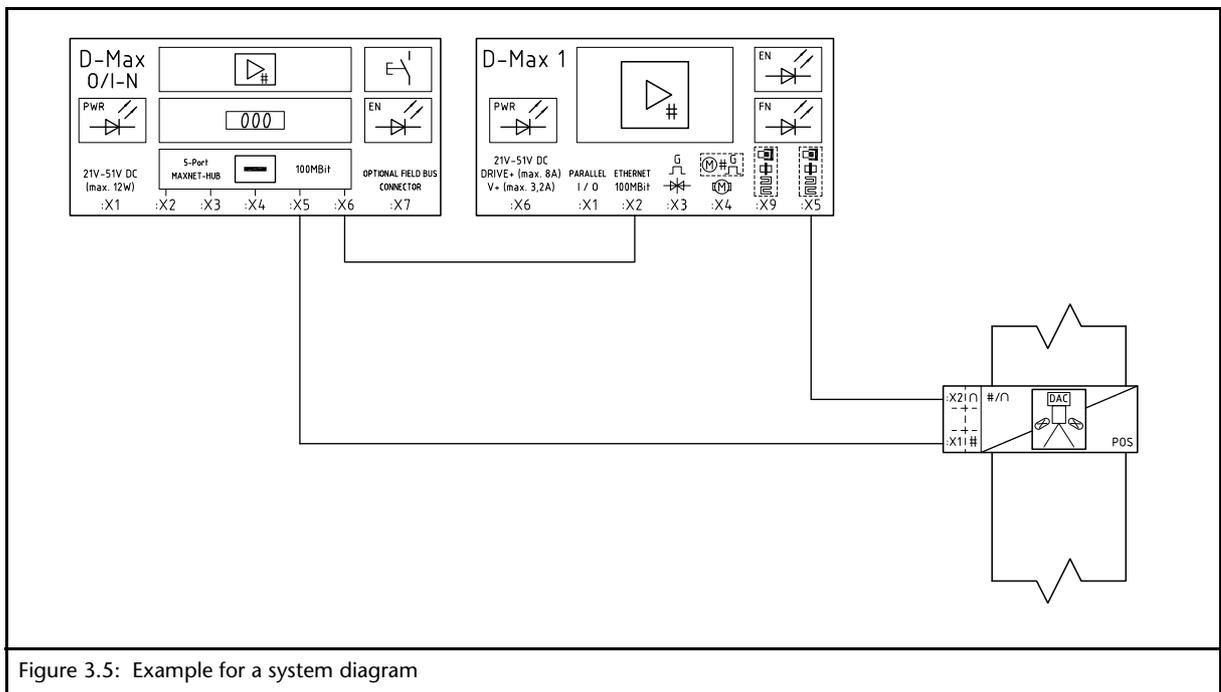


Figure 3.5: Example for a system diagram

- DAC-005 camera connections**
- X1: Ethernet
  - X2: Power supply, analogue signals, digital signals and serial interface to D-MAX OI-S operator interface

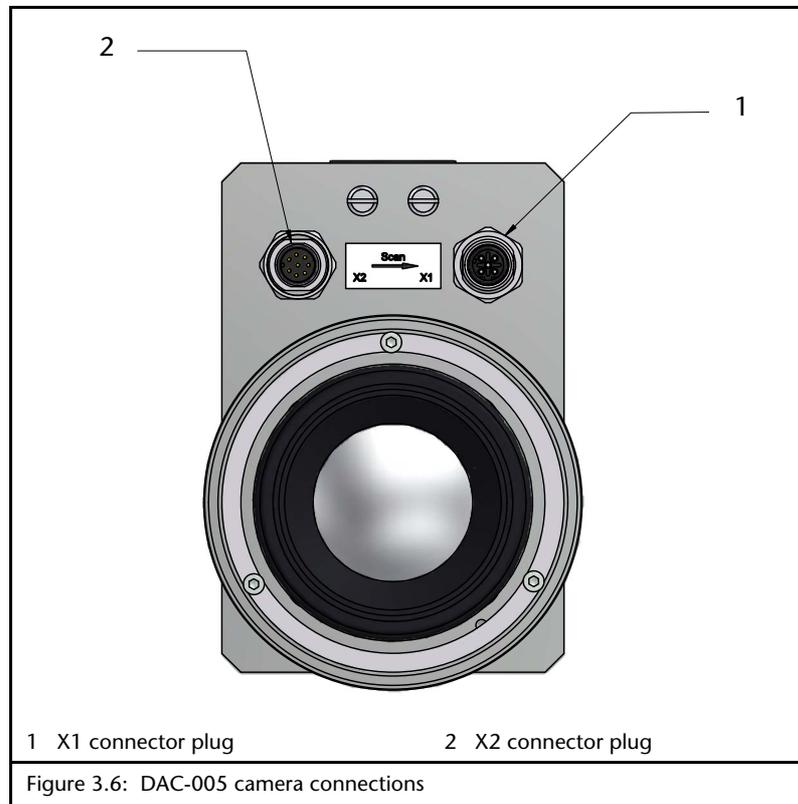


Figure 3.6: DAC-005 camera connections

For technical details and additional information, please consult Section [Technical data](#).

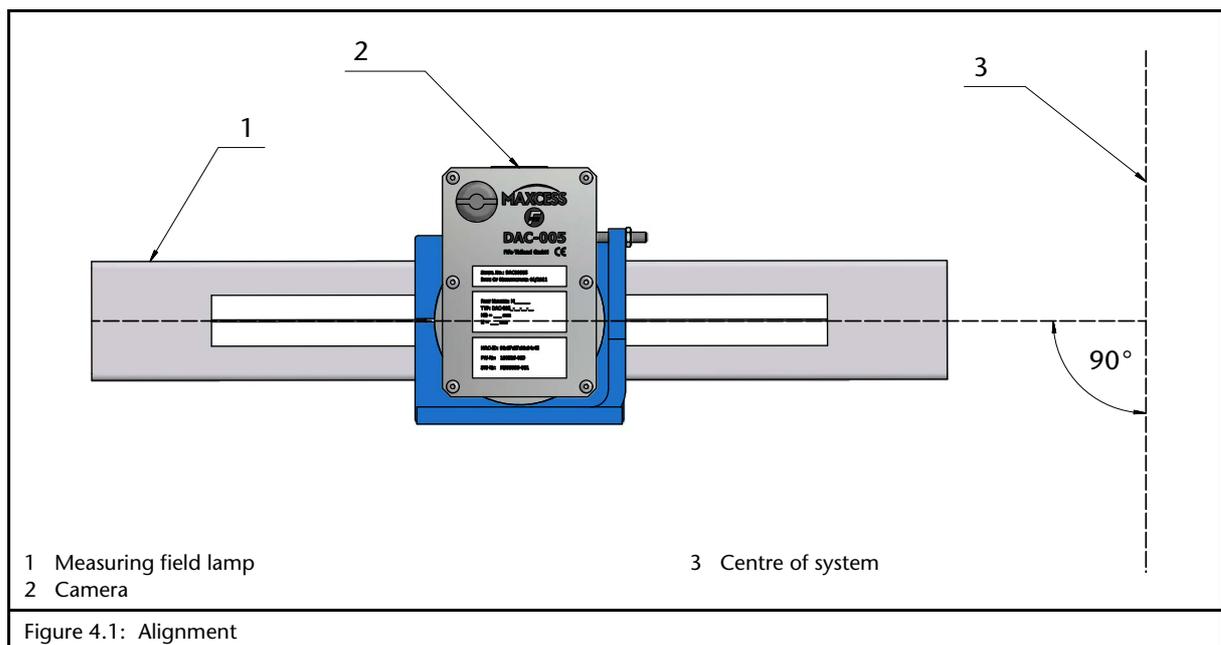
## 4 COMMISSIONING DAC-005

### Safety instructions

On commissioning, the [Safety instructions, Page 2-1](#) must be observed.

### Requirements for commissioning

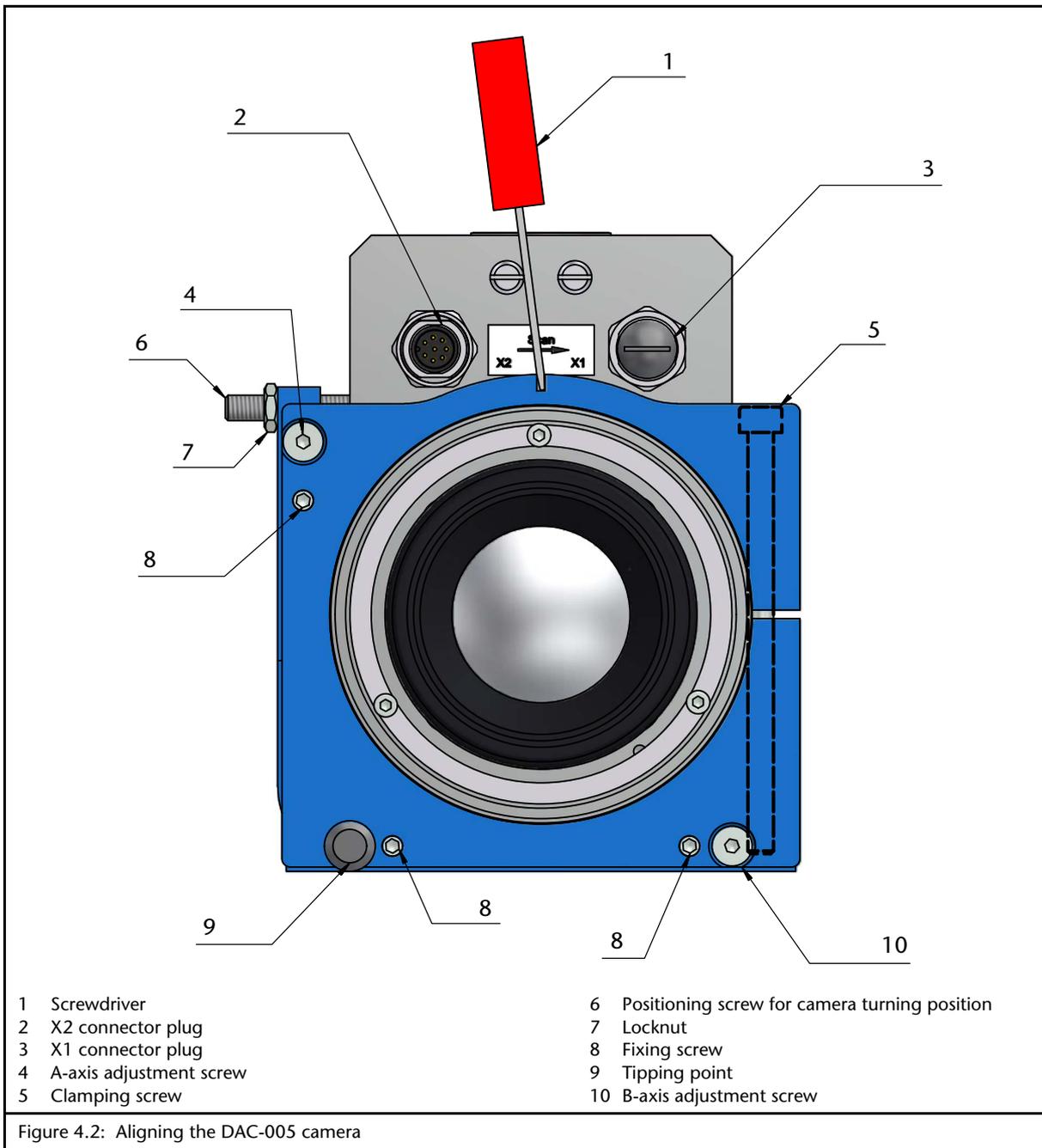
The camera must be mounted according to the customer drawing. The camera must be aligned in such a way that the arrow for the scanning direction is parallel to the measurement field lamp. The measuring field lamp must be mounted at right angles to the direction in which the web is running.



There must not be any objects in the camera's field of view. All photodiodes must receive as much light as possible. If a material web covers over a part of the field of view, the web must be removed. Narrow webs can be moved correspondingly. If a test material is used during adjustment, this material must be positioned at the same distance from the camera as the regular material web. To achieve an optimal controller result, the camera must be precisely aligned to the measuring field lamp.

### Align camera mechanically

Turning the DAC-005 aligns the scanning direction of the camera to the lighting. Swivelling the camera about the A and B axes aligns the position of the field of view to the lighting.



The correct alignment of the camera is evaluated on the D-MAX operator interface using the camera video signal.

- Select [Menu 1y.4.1 Adjust Optic, Page 7-14](#) on the D-MAX operator interface

### Turn camera

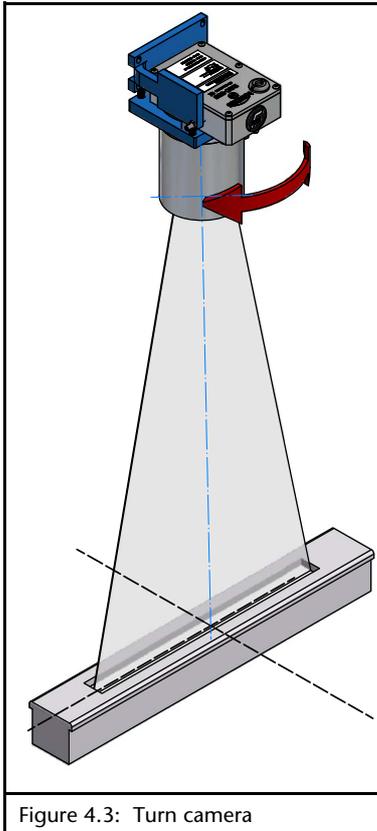


Figure 4.3: Turn camera

When the photodiodes are equally illuminated, the oscilloscope view on the operator interface shows an almost vertical pattern for the brightness level (see [Figure 4.4](#)). A diagonal pattern means that the photodiode line is not aligned parallel to the measuring field lamp.

- Loosen clamping screw (5 - [Figure 4.2](#))
- Align the camera parallel to the measurement field lamp using a screwdriver (see [Figure 4.2](#) and [Figure 3.3](#))
- Secure camera against turning with the clamping screw (5 - [Figure 4.2](#))
- Secure this position with the screw (6 - [Figure 4.2](#)) and the locknut (7 - [Figure 4.2](#))

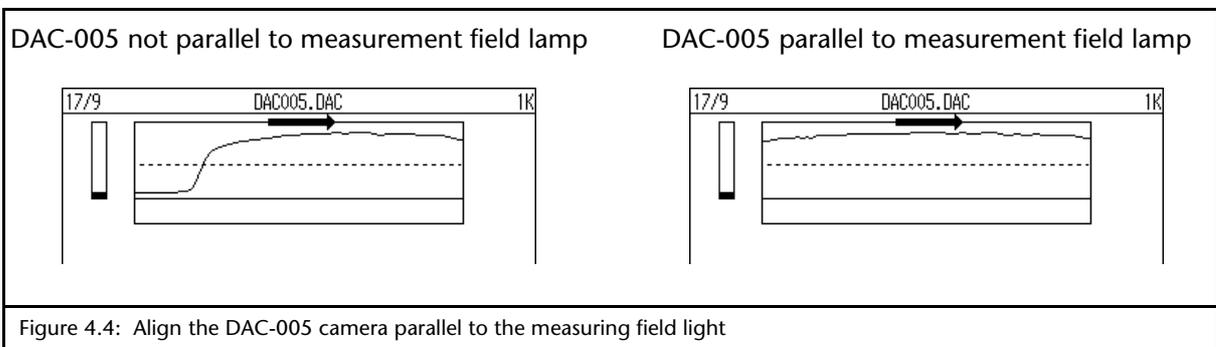
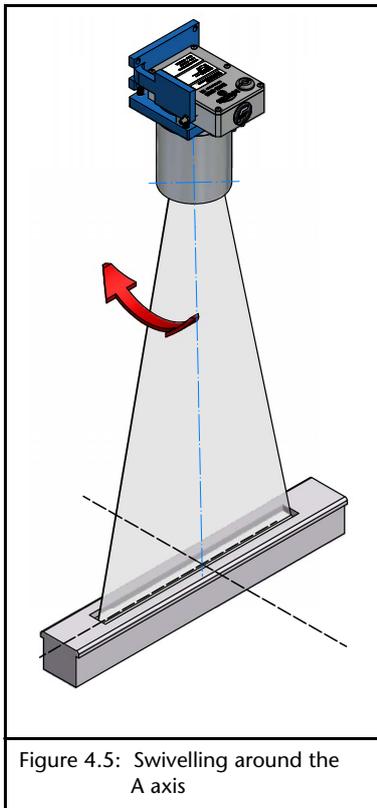


Figure 4.4: Align the DAC-005 camera parallel to the measuring field light

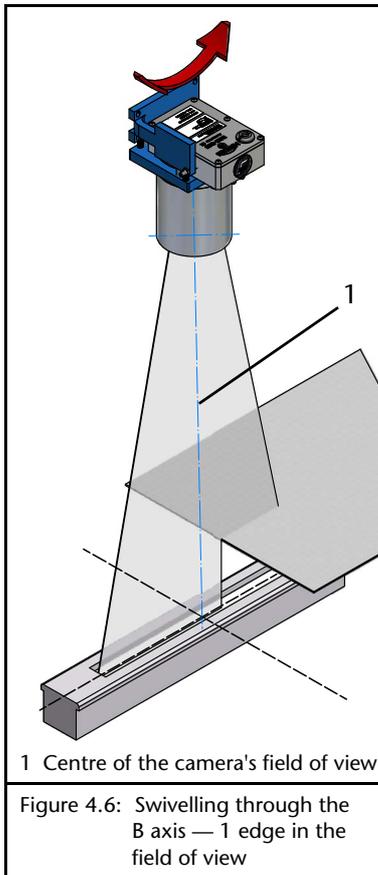
### Swivelling the camera around the A axis



Check whether the camera is aligned with the centre of the measuring field lamp (max. brightness). Swivel the camera through the A axis until the oscilloscope display of the D-MAX operator interface has reached its maximum amplitude.

- Loosen the fixing screw (8 - [Figure 4.2](#)) next to the A-axis adjustment screw (4 - [Figure 4.2](#) and [Figure 4.5](#))
- Align camera to the measurement field lamp with the A-axis adjustment screw (4 - [Figure 4.2](#))
- Secure this position with the fixing screw (8 - [Figure 4.2](#)) next to the A-axis adjustment screw (4 - [Figure 4.2](#))

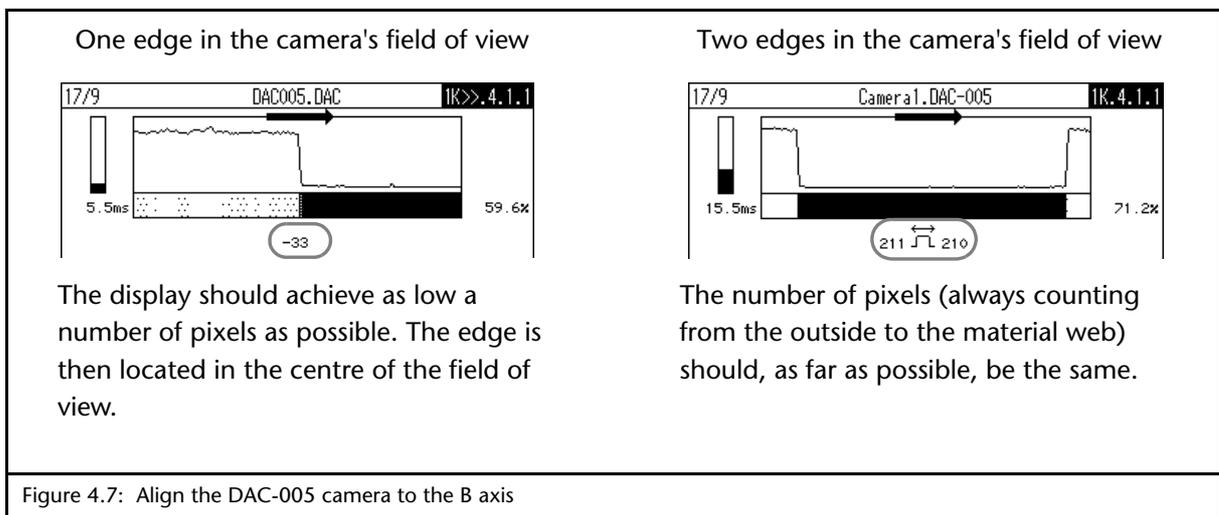
## Swivelling the camera around the B axis



Using a piece of test material, check whether the centre of the camera field of view is in the required position. To do this, the camera must be swivelled through the B axis.

**i** Note:  
The test material must be the same distance from the camera as the regular material web.

- One edge in the camera's field of view:  
The edge of the test material must be positioned so that it defines the centre of the camera's field of view (see [Figure 4.6](#), page 4-5).
- Two edges in the camera's field of view:  
The test material with a width slightly smaller than the camera's field of view (MB in the customer drawing) is positioned in the centre of the camera's field of view so that both edges are visible on the oscilloscope display of the D-MAX operator interface.
- Loosen the fixing screw (8 - [Figure 4.2](#)) next to the B-axis adjustment screw (10 - [Figure 4.2](#) and [Figure 4.6](#))
- Align camera to the measurement field lamp with the B-axis adjustment screw (10 [Figure 4.2](#))



- Secure this position with the fixing screw (8 - [Figure 4.2](#)) next to the B-axis adjustment screw (10 - [Figure 4.2](#))

---

## Aligning the lens

The following settings are only required if the factory setting of the camera is not suitable for the present installation situation. Adjust the settings as follows:

- Select *Menu 1y.4.1 Adjust Optic, Page 7-14* on the D-MAX operator interface
- Insert test material



Note:

The test material, the width of which is somewhat less than the camera field of view, is laid in the centre of the field of view such that both edges can be seen in the oscilloscope display. The test material must be the same distance from the camera as the regular material web.

- Unscrew the protective tube
- Loosen clamping screws (9 - *Figure 1.3*) if present
- Set the aperture (see *Set the aperture, Page 4-6*)
- Set the zoom if present (see *Set the field of view (focal length, zoom), Page 4-7*)
- Set the focus (see *Set the field of view (focal length, zoom), Page 4-7*)
- Lightly tighten the clamping screws (9 - *Figure 1.3*) if present



---

**CAUTION:**

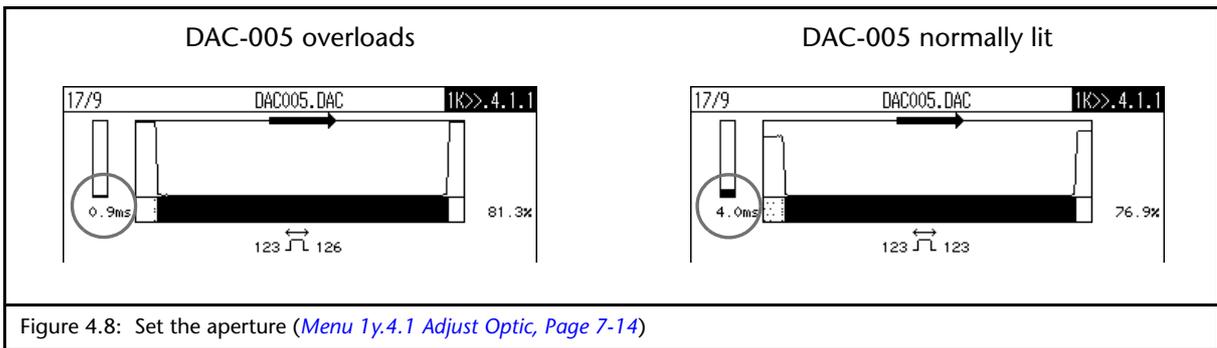
Tightening the clamping screws too much can damage the lens.

---

- Screw on the protective tube

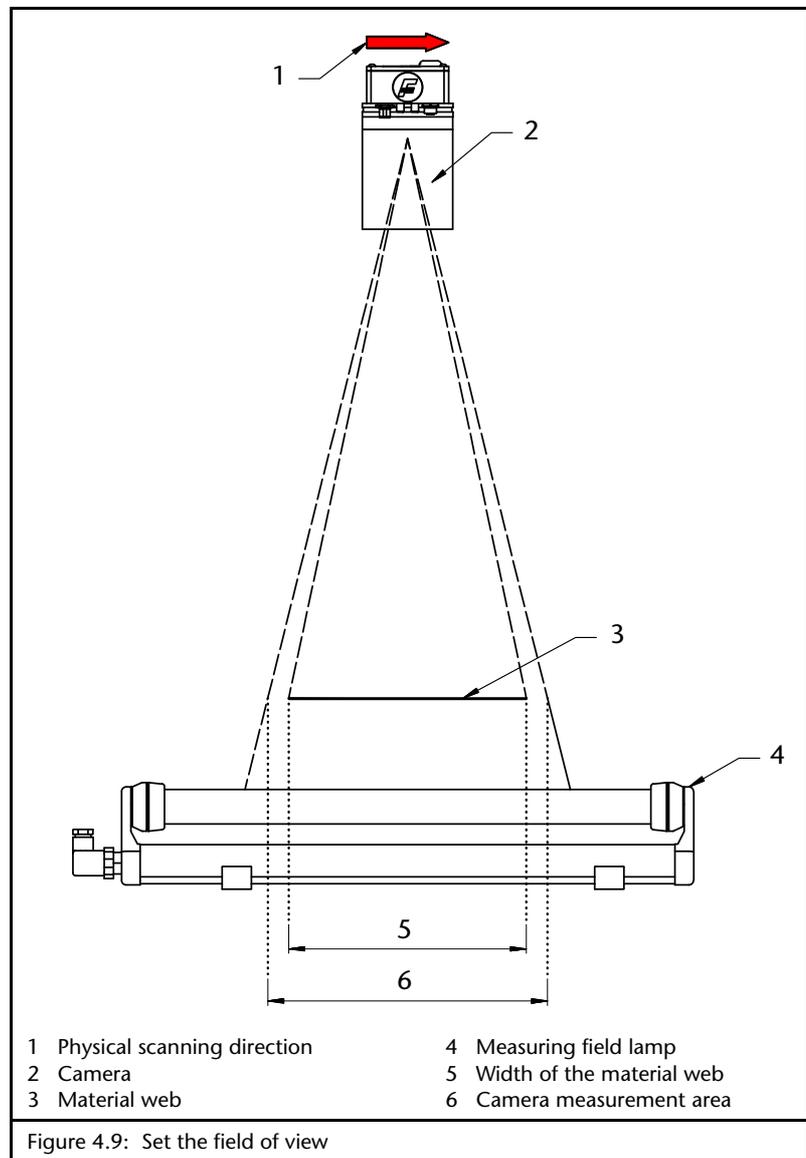
## Set the aperture

If the aperture setting is correct, a nearly rectangular signal will be visible on the oscilloscope (see *Figure 4.8*). The exposure time should be as short as possible. There must not be any overshooting. To make adjustments, turn the aperture setting ring on the lens (see 8 - *Figure 1.2* and 6 - *Figure 1.3*) of the camera.



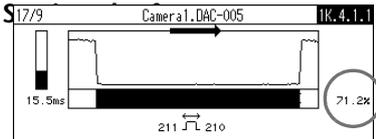
### Set the field of view (focal length, zoom)

The field of view can be changed using the focal length ring on the F mount lens (6 - *Figure 1.3*).





**Note:**  
If the automatic time is also used to monitor lamp dirt contamination, it is essential to ensure that the field of view selected is not too small. Otherwise, not enough light will fall on the photodiodes.



To achieve a high contrast in the signal display, the focus must be set accordingly on the lens. This achieves steep edges in the signal display.

---

### Optional - brightness correction

It is possible to correct the brightness signal curve if it is not linear enough (see [Menu 1y.4.2 Brightness Correction, Page 7-15](#)).

---

### Optional - calibration

If the DAC-005 camera is to be operated in a web width application, it must be calibrated (see [Menu 1y.4.3 Calibration, Page 7-16](#)).

---

### Optional — setting the camera position

The camera is assigned an absolute position either within a system of several cameras or in relation to a fixed point (e.g. the centre of the system) (see [Menu 1y.4.4 Calibrate Camera Position, Page 7-19](#)).

## 5 COMMISSIONING OF WEB GUIDE CONTROLLERS

### D-MAX



**Note:**

Detailed information about sensor calibration is available in the "D-MAX Operating Instructions". "Supplementary Operating Instructions" may also be available.

**Precondition:**

The camera is connected to the D-MAX controller on X5 or X9 input, according to the information in the system diagram.



**Operation:**

The camera is operated via a D-MAX OI-B or OI-N operator interface, or via a PC-based virtual OI.



During the calibration process, the A key (select "Device") must be used to switch between the D-MAX controller (D-MAX controller menu structure) and the DAC-005 camera (DAC-005 menu structure), if this is necessary for operation.

### Calibrating the analogue signal inputs of the D-MAX Controller



**1. Preparing the D-MAX Controller for calibration:**

- Press the A key to select the D-MAX Controller to which the camera is connected
- Press the F3 key to set "Manual" operating mode on the selected D-MAX Controller

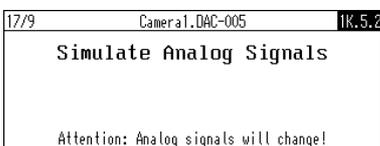


**2. Calibrating the position signal on the D-MAX:**

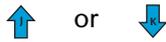
The signals needed for calibration are simulated by the camera.



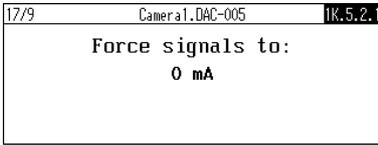
- Press button A to select the menu structure of the DAC-005 camera
- Menu 1y.5.2.1 *Select "Simulate Analog Signals"* (Hardware outputs → Simulate Analog Signals)



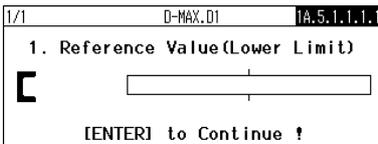
- Press the ENTER key



Using the arrow keys, select Force signals to 0 mA



- Press button A to select the menu structure of the D-MAX controller



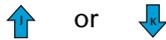
- Select Menu 1y.5.1.1.1 for S 01, Menu 1y.5.1.2.1 for S 02, Menu 1y.5.1.3.1 for S 03 or Menu 1y.5.1.4.1 for S 04 (Hardware IOs → Sensor Setup → S 01 (X5/1), S 02 (X5/2), S 03 (X9/1) or S 04 (X9/1) → Calibration → 1. Reference Value (Lower Limit))



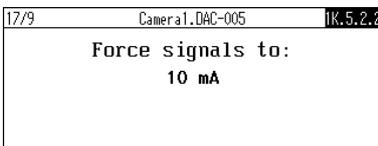
- Press the ENTER key



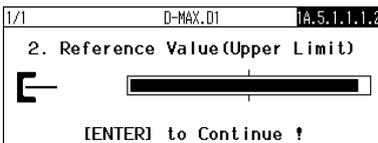
- Press button A to select the menu structure of the DAC-005 camera



- Using the arrow keys, select Force signals to 10 mA



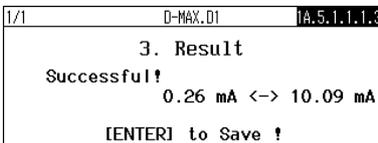
- Press button A to select the menu structure of the D-MAX controller



- 2. Reference value (Upper Limit)



- Press the ENTER key



- Press the ENTER key to save the calibration



- Press and hold the ESC key until you reach the user level of the controller



- Press button A to select the menu structure of the DAC-005 camera



- Press and hold the ESC key until the user level of the camera is reached

### DP-20/DP-30



**Note:**

Detailed information about sensor calibration is available in the "DP-20 Operating Instructions" or the "DP-30 Operating Instructions".

**Requirement:**

With a DP-20 processor, the camera must be connected to the X4 input or with a DP-30 processor to the X5 input in accordance with the specifications in the system diagram.



or



**Operation:**

The camera is operated via a D-MAX OI-B or OI-N operator interface, or via a PC-based virtual OI.



- Press button A to select the menu structure of the DAC-005 camera

### Calibrating the analogue signal inputs of the controller



**1. Preparing the DP-20/DP-30 controller for calibration:**

- Press the Manual key to set "Manual" operating mode on the selected DP-20/DP-30 Controller

**2. Calibrating the position signal on the D-MAX:**

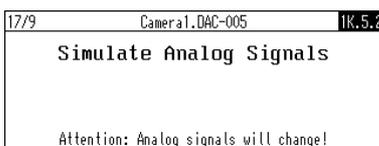
The signals needed for calibration are simulated by the camera.



or



- Using the **D-MAX Operator Interface**



- Menu 1y.5.2.1 *Select "Simulate Analog Signals"* (Hardware outputs → Simulate Analog Signals)



- Press the ENTER key





- Switch to the **DP-20/DP-30** processor



Determine the second reference value



- Press the **ENTER** key

If the calibration was successful, the DP-20/DP-30 web guide controller returns to the user area.



or



- Switch to the **D-MAX Operator Interface**



- Press and hold the **ESC** key until the user level of the camera is reached

---

## 6 OPERATION

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---

### Precondition

Commissioning of the DAC-005 camera must be successfully performed as described in Section [Commissioning DAC-005](#) of these Operating Instructions.

---

### Note

The following section is a supplementary description of the D-MAX operator interface, containing information about how to operate the DAC-005 camera via the interface.



**WARNING:**

All safety instructions as well as information on installation, operation and maintenance of the D-MAX operator interface can be found in the "D-MAX" operating instructions.

---

---

### Safety instructions

While the sensor is in operation, the following safety instructions must be observed.



**WARNING:**

When the web guide controller that the camera is cabled to is in operation, there is a danger of cutting the material web and crushing the actuator.



⇒ For this reason, do not reach onto or close to the material web or the moving parts of the connected actuator.

---



**WARNING:**

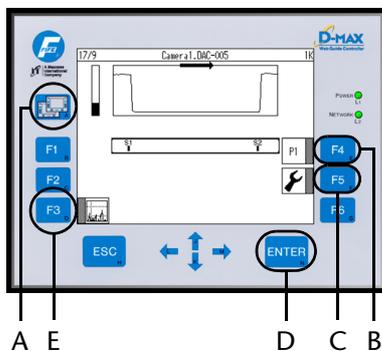
Direct eye contact with the sensor illumination carries a danger of temporary blinding and accidents resulting from this (see also [Page 2-2](#)).

⇒ Direct eye contact with the sensor illumination must be avoided.

---

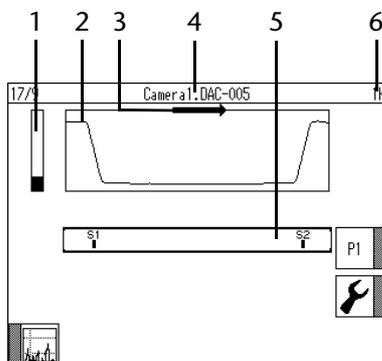
## User level

All information and control functions required for normal operation of the DAC-005 camera appear on the user level of the D-MAX operator interface.



### Buttons

- A Select DAC-005 camera
- B Select profile
- C Favourites (see [Favourites, page 6-5](#))
- D Switch to the menu structure
- E Switch between brightness and contrast signal (optional)



### Display

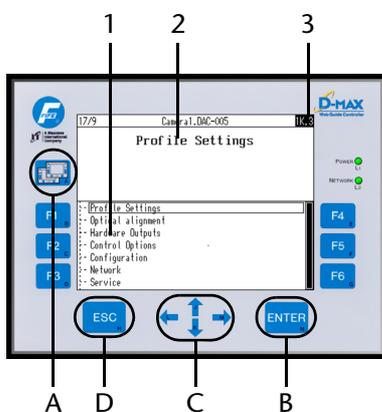
- 1 Exposure time
- 2 Signal display (example shows brightness signal)
- 3 Device designation
- 4 Virtual scanning direction
- 5 Sensor channel
- 6 Menu identification

## Menu level

The basic properties of the DAC-005 camera can be set for the relevant customer application in the menu level.



- Press the ENTER key to switch from the user level to the menu level



### Tasten

- A – Select DAC-005 camera
- B – Switch to lower menu level or menus
  - Saved entries
- C – Navigate in the menu levels/menus
  - Mark numeric entry/entries in lists
- D – Switch to higher menu levels
  - Exit menus without saving

### Display

- 1 Menu structure
- 2 Display of selected menu (marked in the menu structure with a rectangle)
- 3 Menu identification

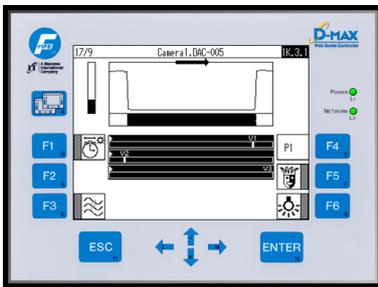
## Profile Settings operator menu

At the menu level, a further operator menu appears after selecting the *Profile Settings* menu (see [Menus 1y.3 Profile Settings, page 7-5](#)).



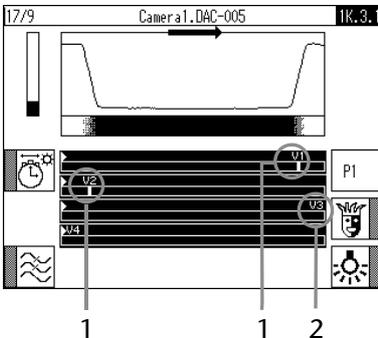
Note:  
The combination of parameters and the signal display change depending on the setting in [Menu 1y.3.1.6 Profile Usage and Presets, page 7-12](#).

The most important parameters for setting up a profile can be accessed directly via the F1 to F6 keys of the D-MAX operator interface:



- F1 key - Exposure time
- F2 key - Threshold\*
- F3 key - Filter size
- F4 key - Display of the selected profile (cannot be changed at this point)
- F5 key - Joker: Lost edge substitution value\*
- F6 key - Light source (optional)
- Enter key - for all profile settings

\* Menus not available for all presets



The sensor channels of the virtual sensors used are displayed underneath the signal display. In the example, these are the V1, V2 and V3 virtual sensors.

- 1 Valid values have been recognised on the V1 and V2 virtual sensors.
- 2 No valid value has been recognised on the V3 virtual sensor. The set value for the Joker is therefore taken for V3.

## DAC-005 camera menus



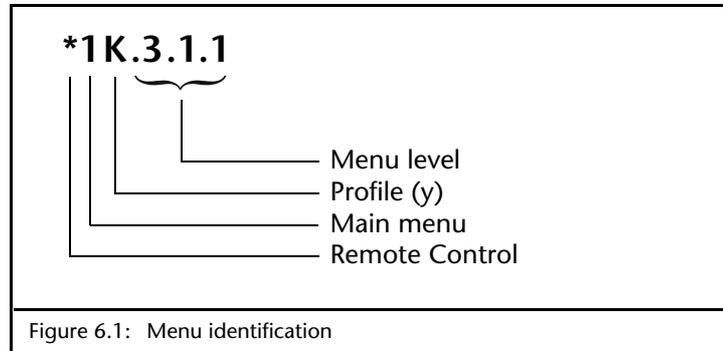
Note:  
Information about how to operate the menus of the D-MAX operator interface may be found in the "D-MAX" operating instructions.

### Menu structure

Section [Menu structure, page 13-1](#) contains an overview of all DAC-005 camera menus.

## Menu identification

Every DAC-005 camera menu has its own designation on the D-MAX operator interface. Therefore, every step in the menu structure for the DAC-005 can be precisely tracked.



**Remote Control:**

- \* - active
- (\*) - blocked
- not present

**Profile (y):** K, L, M and N possible

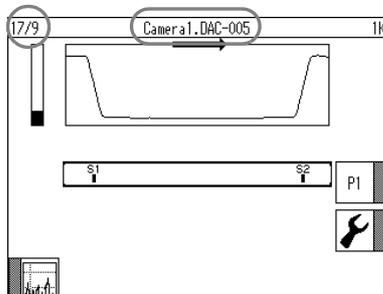
**Menu levels:** Identifies the position of a menu within the structure

## Select DAC-005

The D-MAX operator interface can be used to operate multiple "devices" in the system (e.g. the D-MAX web guide controllers or the DAC-005 camera). To operate the DAC-005 camera, the menu structure of the camera must be selected on the operator interface.



- Press the A key until the desired camera appears in the display



The name of the selected camera appears at the top in the centre of the display

## Profile

Profile contains the parameters set in the *Profile Settings* menu group the last time the profile was used.

The profile P1 is set as standard. Up to three further profiles can be enabled for use in [Menu 1y.6.3 Enable/Disable Profiles, page 7-29](#).

The user can load another setting for the camera by switching the active profile and can continue to work with it immediately. The settings for recurring references, for example when the material is changed often, can thus be reused without having to set up the parameters of the *Profile Settings* menu group again.



- Press the F4 key to switch between the profiles

P1	Profile P1 - Menu identification K
P2	Profile P2 - Menu identification L*
P3	Profile P3 - Menu identification M*
P4	Profile P4 - Menu identification N*

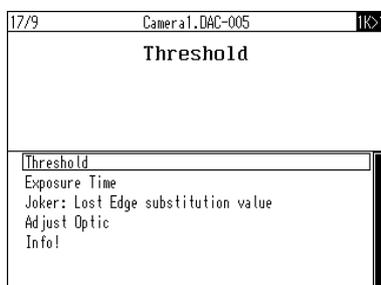
\* optionally enabled

## Favourites

A quick access feature can be used to execute the most important menus for operating the DAC-005 camera.



- Press the F5 key to switch to the menus



The following Fn menus are available:

- 1y>1 Threshold\*, see also [Menu 1y.3.1.1 Threshold, page 7-6](#)
- 1y>2 Exposure Time, see also [Menu 1y.3.1.2 Exposure Time, page 7-7](#)
- 1y>3 Joker: Lost Edge substitution value\*, see also [Menu 1y.3.1.5 Joker: Lost Edge substitution value, page 7-11](#)
- 1y>4 Profile Settings, see also [Menus 1y.3 Profile Settings, page 7-5](#)
- 1y>5 Adjust Optic, see also [Menu 1y.4.1 Adjust Optic, page 7-14](#)

- 1y>6 Remote Control,  
see also [Menu 1y.2 Remote Control, page 7-3](#)

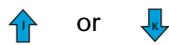


Note:

The *Remote Control* menu only appears in the list when a remote control is actually present.

- 1y>7 Info !,  
Serial number, FW number and SW number of the DAC-005 camera are displayed.

\* Menus not available for all presets



- Select the desired menu with the arrow keys



or



- Enable the desired menu for processing with the Enter key  
or  
Press the ESC key to exit the list of Favourites

## 7 DAC-005 MENUS

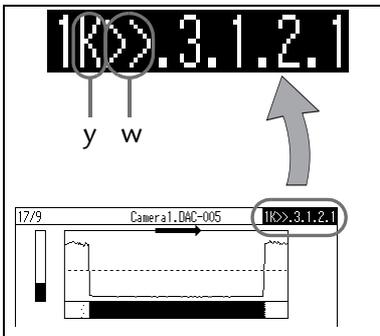
### Notes

This section contains a description of menus that are needed for commissioning and to adjust further settings of the DAC-005 camera.

Section [Menu structure, page 13-1](#) contains an overview of all menus.

### Conventions

The following conventions apply to the menus described here:

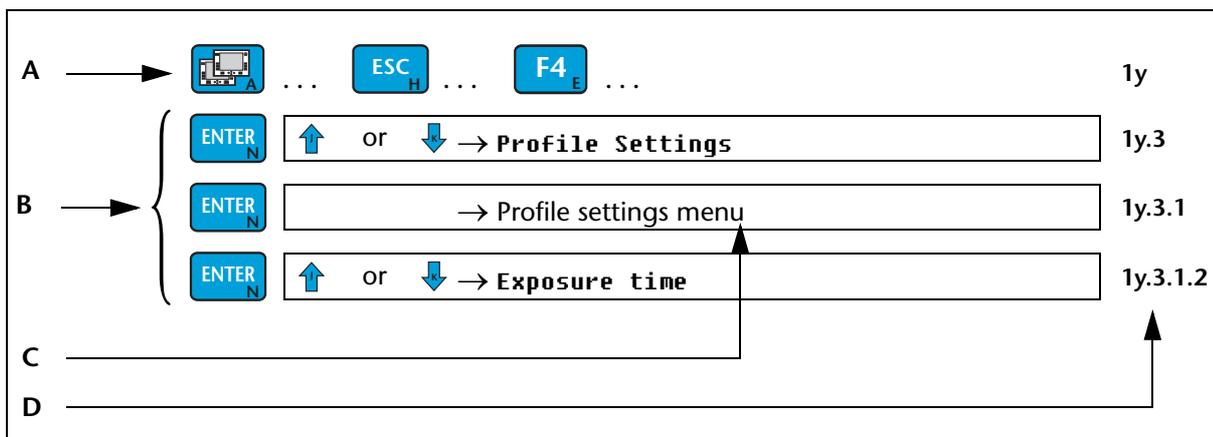


**y**  
Placeholder "y" is the profile currently selected on the camera (In the example, y = K - profile P1, see [Menu identification, page 6-4](#)). This position in the menu identification changes depending on the profile selected by the customer.

**w**  
The characters ">>" indicate that this is a favourite menu, reached via the F5 key.

### Key sequence

A key sequence is shown for each menu described in this section. This key sequence is the precise sequence for accessing a menu. Each sequence starts from a defined position.



## A: Restoring the original state



...

- Select DAC-005 camera:  
Care should be taken that the menu structure of the camera is selected on the D-Max operator interface.



...

- To reach the user level:  
The key sequence for a given menu is always based on the assumption that the camera menu structure can be found at the user level. To do this, continue pressing the "ESC" key or hold it down until the user level (menu identification 1y) is reached.



...

- Selecting profile:  
Make sure that the correct profile is selected.

## B: To access the menu

To access the desired menu, carry out the sequence in the specified order.

## C: Operator menu

A further operator menu appears in the menu tree.

## D: Menu identification

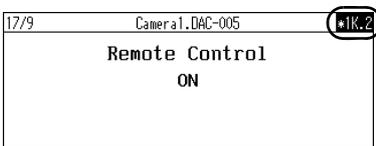
The specification of the menu identification is used to check the selected menu.

## Menu 1y.2 Remote Control

A *Remote Control* can be activated or deactivated with the menu. Remote control can be carried out via:

- A field bus interface,
- The controller to which the DAC-005 camera is connected,
- An application in a "distributed system" that manages various "devices" at the same time (see [Menu 1y.7.5 Distributed System, page 7-32](#)).

The application can activate each of these "devices" externally.



A \* appears before the menu identification of the status line to identify *remote control* (see [Menu identification, page 6-4](#)):

\* - A remote control is active

(\* ) - A remote control is present, but has been locked by the menu itself

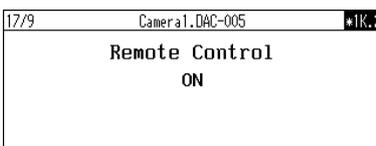
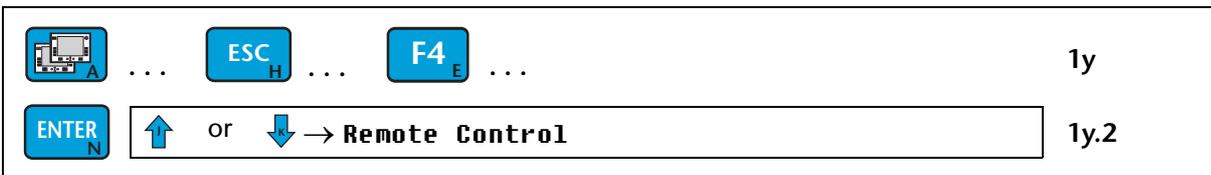
If there is no \* in the menu identification, no *remote control* is present.



Note:  
This menu is only available if *Remote Control* is present.

### Menu

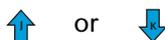
- Key sequence for menu 1y.2:



It shows the current setting for the *remote control* parameter.



- Enable the parameter for processing



- Select the required setting

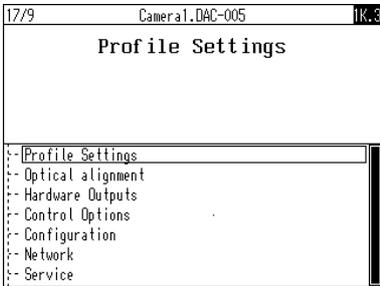


or



- Save or cancel the entry

## Menu 1y.3 Profile Settings

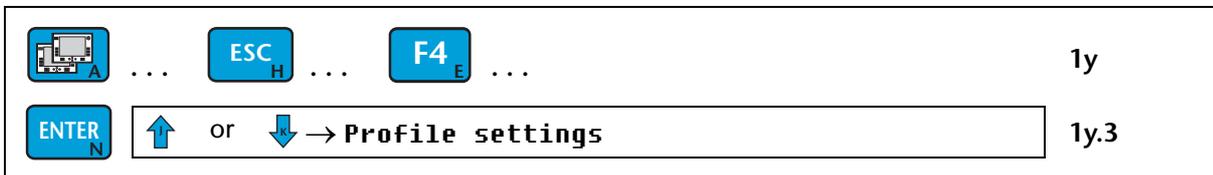


The *Profile Settings* section is a description of menus that are used to set up the parameters of a profile. A similar set of parameters is available for each profile present in the system.

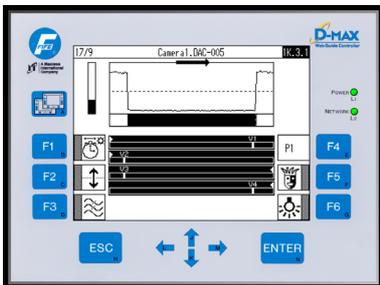
Each profile is identified by a capital letter in the status line (see Page 6-4).

### Menu

- Key sequence for menu 1y.3:



- Select the *Profile Settings* menus

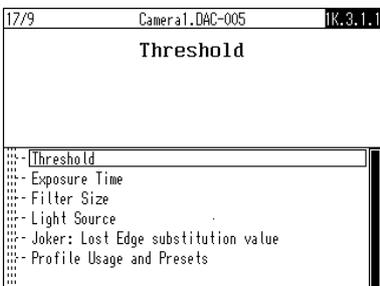


As a special feature in the menu structure of the DAC-005 camera, an operator menu appears again at this point (see also [Profile Settings operator menu, page 6-3](#)).

**i** Note:  
Several parameters can also be accessed directly via the F1 to F6 keys of the D-MAX operator interface. These menus can be found on the following pages by means of the menu identification.



- Press the Enter key to continue in the menu structure



All the parameters that exist for a profile can be selected in this list.

## Menu 1y.3.1.1 Threshold

The *Threshold* menu defines the exposure level at which the photodiodes are defined as being light or dark (see also [Threshold, page 1-8](#)).



Note:  
The *Threshold* menu is not available when "Automatic Edge Detection" is selected in [Menu 1y.3.1.6 Profile Usage and Presets, page 7-12](#).

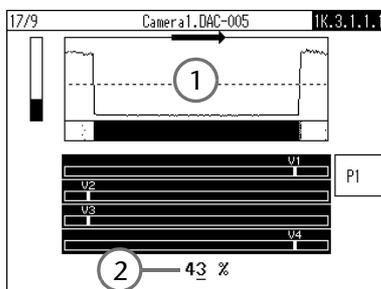
### Menu

- Key sequence for menu **1y.3.1.1**:

	...		...		...	1y
	↑ or ↓ → Profile Settings					1y.3
	→ Profile settings menu					1y.3.1
	↑ or ↓ → Threshold					1y.3.1.1



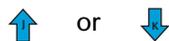
- Enable the parameter for processing



- 1 - The graphical Threshold display begins to blink.
- 2 - The value in the numeric Threshold display [%] can now be changed.



- Position the cursor under the decimal point of the value you want to change



- Change the value of the selected decimal place



or



- Save or cancel the entry

### Menu 1y.3.1.2 Exposure Time

In the *Exposure Time* menu, either



manual setting of the exposure time



or automatic exposure can be selected (see also [Aperture and exposure time, page 1-6](#)).



For automatic exposure, an exposure time alarm can also be set. This alarm is used, for example, to signal a failure or dirt on the measuring field lamp.

#### Menu

- Key sequence for menu 1y.3.1.2:

	...		...		...	1y
	↑ or ↓ → Profile Settings					1y.3
	→ Profile settings menu					1y.3.1
	↑ or ↓ → Exposure time					1y.3.1.2



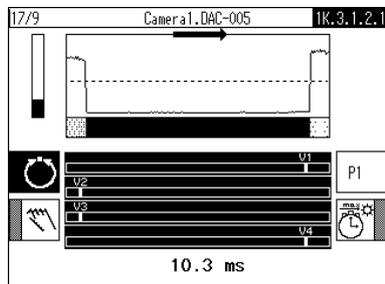
- Enable the parameter for processing

The current setting for the *Exposure Time* parameter is shown.

#### Automatic exposure mechanism



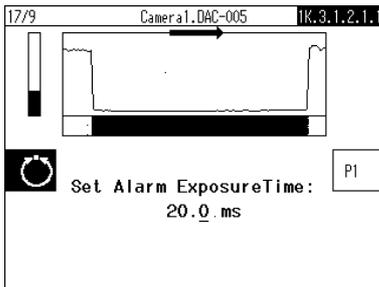
- Press the F1 key to select automatic exposure



The current exposure time is shown.

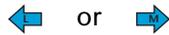


- Press F5 to open the *Set Alarm Exposure Time* menu

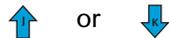


The value for the exposure time alarm [ms] can now be changed.

Standard value = 20ms



- Position the cursor under the decimal point of the value you want to change



- Change the value of the selected decimal place



or

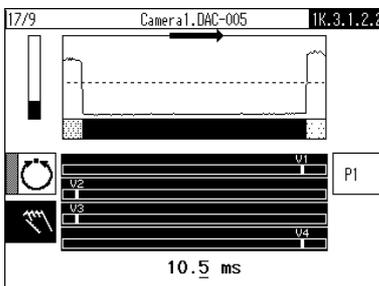


- Save or cancel the entry

### Manual exposure time

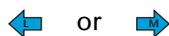


- Press the F2 key to select the manual setting of the exposure time

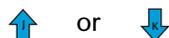


The value for the exposure time [ms] can now be changed.

An exposure time up to a maximum of 50ms is possible.



- Position the cursor under the decimal point of the value you want to change



- Change the value of the selected decimal place



or



- Save or cancel the entry

### Menu 1y.3.1.3 Filter Size

The signal quality can be influenced with the aid of a filter. The *Filter Size* menu is used to set the size of the filter [in pixels] (see [Filter](#), page 1-8).

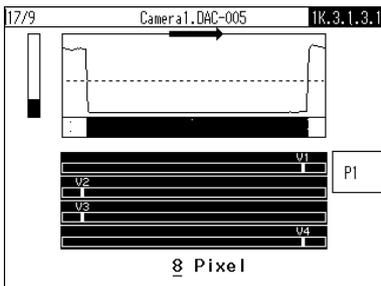
#### Menu

- Key sequence for menu **1y.3.1.3**:

	...		...		...	1y
	↑ or ↓ → Profile Settings					1y.3
	→ Profile settings menu					1y.3.1
	↑ or ↓ → Filter size					1y.3.1.3

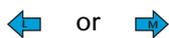


- Enable the parameter for processing

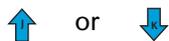


The value for the filter size [in pixels] can now be changed.

Standard value = 8pixels



- Position the cursor under the decimal point of the value you want to change



- Change the value of the selected decimal place



or



- Save or cancel the entry

## Menu 1y.3.1.4 Light Source

In the *Light Source* menu, it is possible to choose between the use of external lighting and optionally available internal lighting (see also [Option, page 1-3](#) and [Layout of diode line camera with C mount lens, page 1-4](#)).



Note:

This menu is only available if the camera has an internal light source (see [Option, page 1-3](#)).

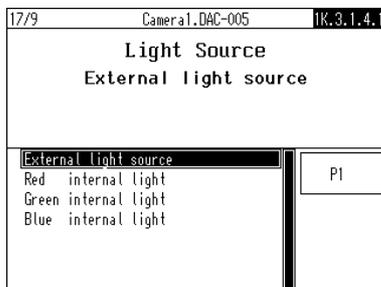
### Menu

- Key sequence for menu 1y.3.1.4:

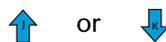
	...		...		...	1y
	↑ or ↓ → Profile Settings					1y.3
	→ Profile settings menu					1y.3.1
	↑ or ↓ → Light source					1y.3.1.4



- Enable the parameter for processing



The current setting for the *Light Source* parameter is shown.



- Select the desired setting for the light source



or



- Save or cancel the entry

### Menu 1y.3.1.5 Joker: Lost Edge substitution value

Use the *Joker: Lost Edge substitution value* menu to specify a fixed value for the analogue output signal of the DAC-005 camera (see also *Joker: Lost edge substitution value, page 1-8*).



**Note:**  
The *Joker: Lost edge substitution value* menu is not available if the entry "Edge detection - low contrast" or "Width measurement - low contrast" was selected in *Menu 1y.3.1.6 Profile Usage and Presets, page 7-12*.

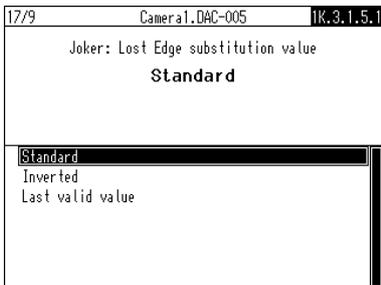
#### Menu

- Key sequence for menu **1y.3.1.5**:

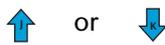
	...		...		...	1y
	↑ or ↓ → Profile Settings					1y.3
	→ Profile settings menu					1y.3.1
	↑ or ↓ → Joker: Lost edge substitution value					1y.3.1.5



- Enable the parameter for processing



The current setting for the *Joker: Lost Edge substitution value* parameter is shown.



- Select the desired setting for the Joker



or



- Save or cancel the entry

## Menu 1y.3.1.6 Profile Usage and Presets

Use the *Profile Usage and Presets* menu to select the profile for a particular use. This also sets the presets for the displays and the menus that exist in the *Profile Settings* menu group (see also [Profile Settings operator menu, page 6-3](#)).



Note:

This menu is not available if the camera is using software modified to customer-specific requirements.

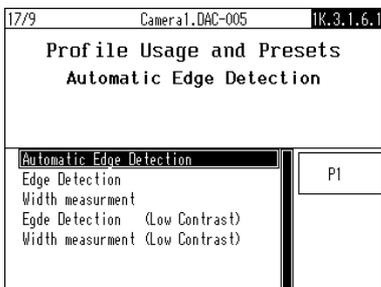
### Menu

- Key sequence for menu 1y.3.1.6:

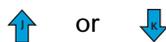
	...		...		...	1y
	↑ or ↓ → Profile Settings					1y.3
	→ Profile settings menu					1y.3.1
	↑ or ↓ → Profile usage and presets					1y.3.1.6



- Enable the parameter for processing



The current setting for the *Profile Usage and Presets* parameter is shown.



- Select the required setting



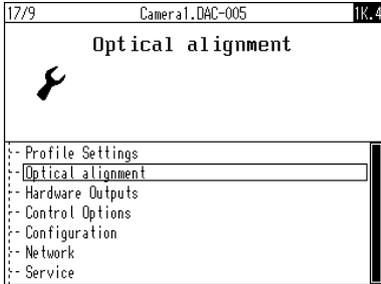
or



- Save or cancel the entry

---

## Menus 1y.4 Optical alignment



The *Optical alignment* section describes the menus that are necessary for optical adjustments during commissioning of the DAC-005 camera.

## Menu 1y.4.1 Adjust Optic

The *Adjust Optic* menu is used to set the

- exposure time,
- field of viewand
- focus of the optics.

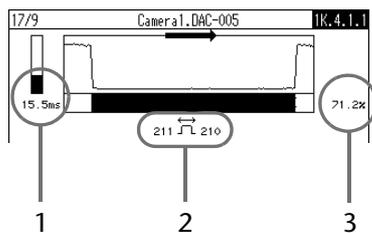
### Menu

- Key sequence for menu 1y.4.1:

	...		...		...	1y
	↑ or ↓ → <b>Optical alignment</b>					1y.4
	↑ or ↓ → <b>Adjust optic</b>					1y.4.1



- Enable the parameter for processing



The current camera settings are displayed.

- 1 Turn the current exposure time displayed on the aperture set ring of the lens to set an exposure time of less than 20ms  
(see [Set the aperture, page 4-6](#))
- 2 Set the field of view
  - one edge in the field of view of the camera:  
The display should show a small number of pixels if possible.  
The edge is in the centre of the field of view.
  - two edges in the field of view of the camera:  
The number of pixels for each to the material web are counted, these should be equal if possible.  
(see [Set the field of view \(focal length, zoom\), page 4-7](#))
- 3 Turn the contrast indicator on the focus of the lens to achieve as high contrast as possible  
(see [Fokus einstellen, page 4-8](#))



- Exit the menu

## Menu 1y.4.2 Brightness Correction

The *Brightness Correction* can correct non-linearities in the brightness signal (see [Brightness correction, page 1-11](#)).

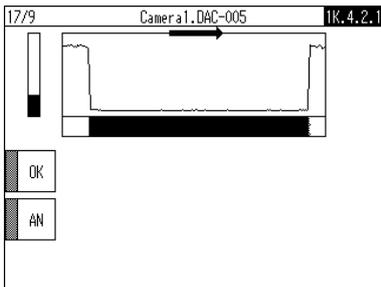
### Menu

- Key sequence for menu 1y.4.2:

	...		...		...	1y
	↑ or ↓ → <b>Optical alignment</b>					1y.4
	↑ or ↓ → <b>Brightness correction</b>					1y.4.2



- Enable the parameter for processing



The current setting for the brightness signal is shown.

- F1 key - OK flashes:  
Calibration of the brightness signal is carried out when the F1 key is pressed.
- F2 key - ON/OFF:  
Pressing the F2 key activates or deactivates *brightness correction*.



Note:  
The F2 key function is only available if the brightness signal has already been calibrated using the F1 key.



or



- Save or cancel the entry

## Menu 1y.4.3 Calibration

The *Calibration* menu can be used to compensate for image errors (see [Calibration, page 1-12](#)).

For calibration, a filter with 0 pixels and an evaluation threshold of 50% of the dynamic range is set. Differing settings in the corresponding width measurement profiles generate additional measurement errors.

For correct calibration, at least six calibration edges must be determined. In addition, it is possible to calibrate only two edges with the aid of an ancillary gauge. Accuracy is correspondingly decreased.

### Calibration methods

1. Calibration with a bar gauge  
The bar gauge consists of a metal plate with equidistant slits.
2. Calibration with an ancillary gauge  
The ancillary gauge consists
  - a. of the material web with a known width or
  - b. a plate with 2 slits whose distance is also known.

### Menu

- Place the bar or ancillary gauge within the field of view



Note:

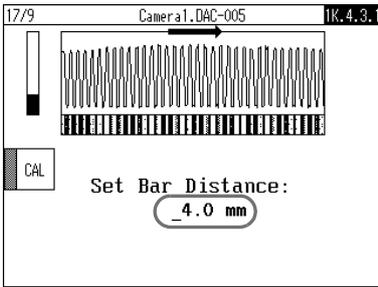
The level in which the gauge is placed must agree with the level of the material web.

- Key sequence for menu **1y.4.3**:

	...		...		...	1y
		or		→	<b>Optical alignment</b>	1y.4
		or		→	<b>Calibration</b>	1y.4.3

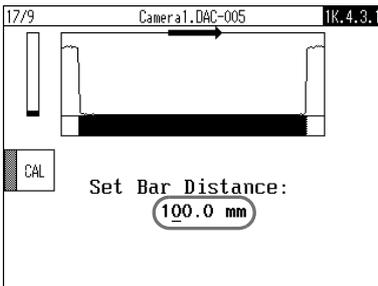


- Enable the parameter for processing  
The F1 - CAL key flashes.



1. Calibration with a bar gauge

The brightness signal curve of the bar gauge is displayed.  
The distance of the bar gauge must be entered (in this example: bar distance of 4 mm).

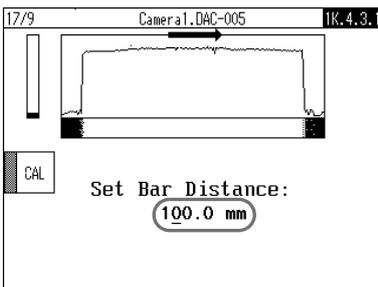


2. Calibration with an ancillary gauge

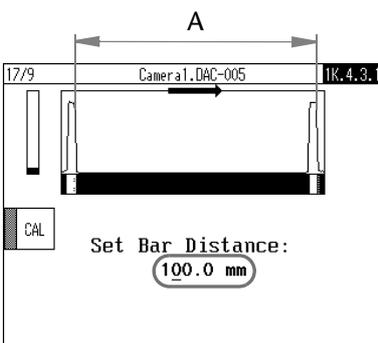
a. Material web with a known width

The brightness signal curve of the ancillary gauge is displayed.  
The width of the material web must be entered (in this example: 100 mm).

The screen shows an opaque material web in a backlit application as an example.



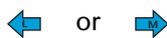
The screen shows a bright material web in an application with reflected light as an example.



b. Plate with 2 slits

The brightness signal curve of the ancillary gauge is displayed.  
Distance "A" from falling edge to falling edge must be entered (in this example, the web width is 100 mm).

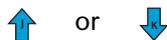
The image shows the 2 brightness peaks in a backlit application. Two falling edges must be visible regardless of the application.



or



- Position the cursor under the decimal point of the value you want to change



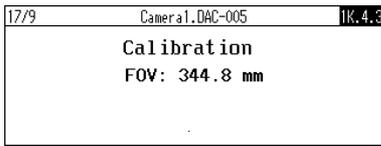
or



- Change the value of the selected decimal place



- Press the F1 key to perform calibration



Upon successful calibration, the menu is exited and the field of view (FOV - Field of View) shown in the selected unit.

## Menu 1y.4.4 Calibrate Camera Position

In the *Calibrate camera position* menu, the camera is assigned an absolute position

- within a system consisting of several cameras or
- in relation to a fixed point (e.g. the middle of the machine)

(see *Camera position, page 1-12*).

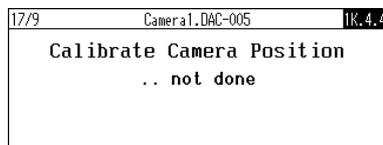


Note:  
This menu is only available if a calibration (*Menu 1y.4.3 Calibration, page 7-16*) has been carried out.

### Menu

- Key sequence for menu 1y.4.4:

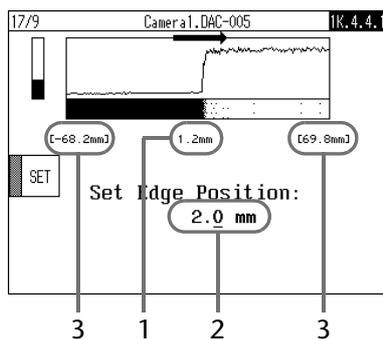
	...		...		...	1y
	↑ or ↓ → <b>Optical alignment</b>					1y.4
	↑ or ↓ → <b>Adjusting camera position</b>					1y.4.4



If the *Calibrate Camera Position* parameter has not yet been processed, the message ... **not done** appears.

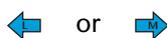


- Enable the parameter for processing  
The F1 - SET key flashes.

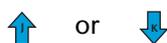


- Lay a gauge with the known dimensions of the camera system on the web
- 1 Display of the current position of the edge in the camera's field of view
  - 2 The required position of the edge in the camera's field of view
  - 3 Values 1 and 2 are used to calculate the absolute position of the field of view

- The edge position (2) must be entered.



- Position the cursor under the decimal point of the value you want to change



- Change the value of the selected decimal place



- Press the F1 key to accept the settings

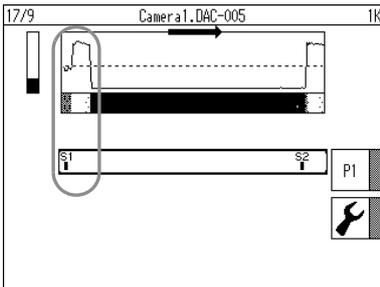


If the settings are successfully accepted, the menu is exited.

### Menu 1y.4.5 Exclude outer areas

The *Exclude outer areas* menu allows errors occurring on the edges of the camera's field of view to be ignored. Such an error could be, for example,

- a machine part that juts into the field of view of the camera, or
- a lamp that is too small and does not illuminate the field of view completely.



Areas can be excluded on one edge only or on both edges.

In the example, the error can be found on the left-hand edge and must be excluded so that the DAC-005 camera works with the correct edge.

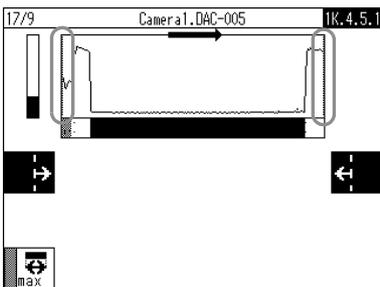
**Menu**

- Key sequence for menu 1y.4.5:

...	...	...	1y
	↑ or ↓ →	Optical alignment	1y.4
	↑ or ↓ →	Exclude outer areas	1y.4.5



- Enable the parameter for processing



Dotted lines blink left and right on the edge of the signal display.

Both outer areas are activated for exclusion.



The left-hand outer area is activated for exclusion



The left-hand outer area is deactivated for exclusion



The right-hand outer area is activated for exclusion



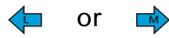
The right-hand outer area is deactivated for exclusion



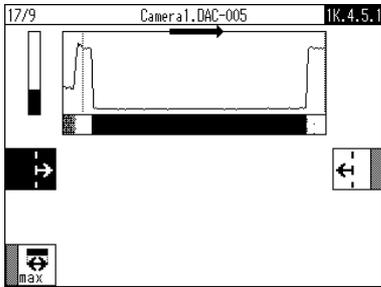
- Press the F1 key to activate or deactivate the exclusion of the left-hand outer area



- Press the F4 key to activate or deactivate the exclusion of the right-hand outer area



- Adjust the excluded areas with arrow keys  
The dotted lines show the excluded area.



In the example, the error on the left-hand edge is excluded.



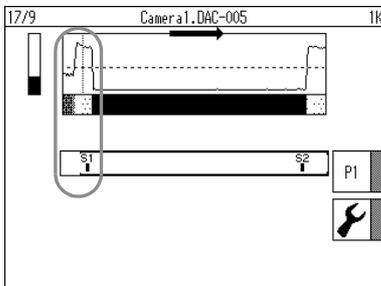
The maximum field of view of the DAC-005 camera can again be set using the F3 key.



or



- Save or cancel the entry



The DAC-005 camera now detects the desired edge. The limited field of view of the camera is shown in the sensor channel.

## Menu 1y.4.6 Rotate mounting direction virtually

The sensing direction of the camera in the customer system can be adjusted with the *Rotate mounting direction virtually* menu (see [Scanning direction, page 1-7](#)).

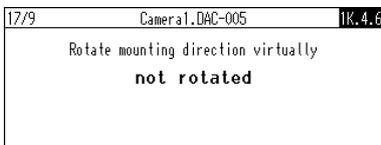


**Note:**  
 This menu is not used to adjust the view on the operator interface display. This must be done using the *1.a.2.1 BMP Alignment* menu (settings 0° or 180°) in the menu of the OI-B or OI-N operator interface (see "D-MAX" instruction manual).

### Menu

- Key sequence for menu **1y.4.6**:

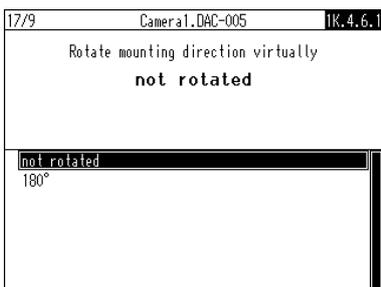
	...		...		...	1y
	↑ or ↓ → <b>Optical alignment</b>					1y.4
	↑ or ↓ → <b>Rotate mounting direction virtually</b>					1y.4.6



The current setting for the *Rotate mounting direction virtually* parameter is shown.



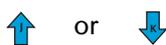
- Enable the parameter for processing



The list displays the possible virtual mounting directions.

**not rotated:** The physical and virtual scanning direction are aligned equally.

**180°:** The virtual scanning direction is aligned opposite to the physical scanning direction.



- Select the required setting



or



- Save or cancel the entry

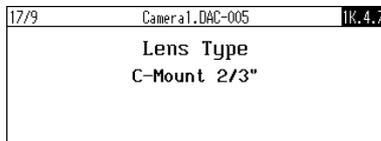
## Menu 1y.4.7 Lens Type

In the *Lens Type* menu, the lenses used in the DAC-005 camera are displayed.

### Menu

- Key sequence for menu 1y.4.7:

	...		...		...	1y
	↑ or ↓ → <b>Optical alignment</b>					1y.4
	↑ or ↓ → <b>Lens type</b>					1y.4.7



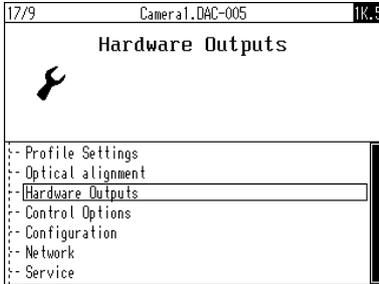
The current setting for the *Lens Type* parameter is shown.



- Exit the menu

---

## Menus 1y.5 Hardware Outputs



The *Hardware Outputs* section describes the menus that define the parameters for the digital outputs and allow simulation of the analogue outputs during commissioning of the web guide controller.

## Menu 1y.5.1 Digital Outputs

The *Digital Outputs* menu is used to configure the physical characteristics of digital outputs 1 and 2 of the DAC-005 camera.

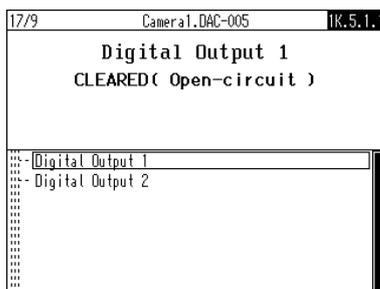
### Menu

- Key sequence for menu **1y.5.1**:

	...		...		...	1y
	↑ or ↓ → <b>Hardware Outputs</b>					1y.5
	↑ or ↓ → <b>Digital outputs</b>					1y.5.1



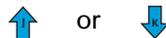
- Enable the parameter for processing



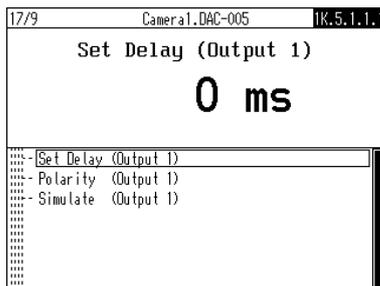
The current setting for the selected digital output is shown.

Menu 1y.5.1.1: **Digital Output 1**

Menu 1y.5.1.2: **Digital Output 2**



- Select the desired digital output

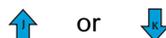


A set of parameters is available for the configuration of each digital output.

Menu 1y.5.1.\_.1: **Set Delay**

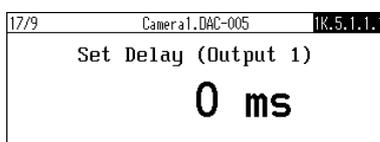
Menu 1y.5.1.\_.2: **Polarity**

Menu 1y.5.1.\_.3: **Simulate**



- Select and configure the desired parameters

### Menu 1y.5.1.\_.1 Delay



A delay time can be defined for the transition from 'Deleted' to 'Set'.

### Menu 1y.5.1.\_2 Polarity

```
17/9 Camera1.DAC-005 1K.5.1.1.2
Polarity (Output 1)
<Set>: <1V
```

The value for the 'set' condition can be adjusted.

Menu 1y.5.1.\_2.1: **<Set>: <1V**

Menu 1y.5.1.\_2.2: **<Set>: Open-circuit**

### Menu 1y.5.1.\_3 Simulate



---

**CAUTION:**

Unintended actions may be triggered on the customer system by changing the digital signals.

⇒ This menu is only to be used for test purposes during commissioning!

---

```
17/9 Camera1.DAC-005 1K.5.1.1.3
Simulate (Output 1)
```

Set/delete digital outputs temporarily

Menu 1y.5.1.\_3.1: **CLEAR (open-circuit)**

Menu 1y.5.1.\_3.2: **SET (< 1V)**

## Menu 1y.5.2 Simulate Analog Signals

In the *Simulate Analog Signals* menu, the analog signals that are necessary for the calibration of the DAC-005 "sensor" on the connected web guide controller are made available.



### CAUTION:

Unintended actuator actions may be triggered by changing the analog signals.

⇒ The controller to which the DAC-005 camera is connected must be placed in "Manual" operating mode.

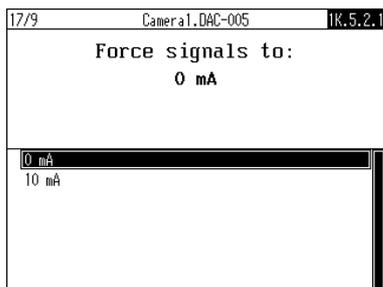
### Menu

- Key sequence for menu 1y.5.2:

	...		...		...	1y
	↑ or ↓ → Hardware Outputs					1y.5
	↑ or ↓ → Simulate analogue signals					1y.5.2



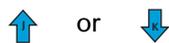
- Enable the parameter for processing



The current setting for the simulation of the analog signal is displayed.

Menu 1y.5.2.1: **0 mA**

Menu 1y.5.2.2: **10 mA**



- Select the required setting



### Note:

The signal that must be made available, and when, can be found in the operating instructions in section [Commissioning of web guide controllers, page 5-1](#).

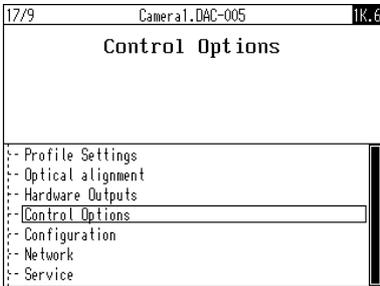


or



- Exit the menu

## Menu 1y.6 Control Options



The *Control Options* section describes the menus that contain the basic parameters for the operation of the DAC-005 camera.

### Menu

- Key sequence for the menus:

	...		...		...	1y
	↑ or ↓ → <b>Control Options</b>					1y.6
	↑ or ↓ → Select the desired menu					1y.6._

### Menu 1y.6.2 Length Unit



Setting up the desired length unit

Menu 1y.6.2.1 **mm**

Menu 1y.6.2.2 **inches**

### Menu 1y.6.3 Enable/Disable Profiles



Activate and deactivate profiles

Menu 1y.6.3.K **(K) P1**

Menu 1y.6.3.L **(L) P2**

Menu 1y.6.3.M **(M) P3**

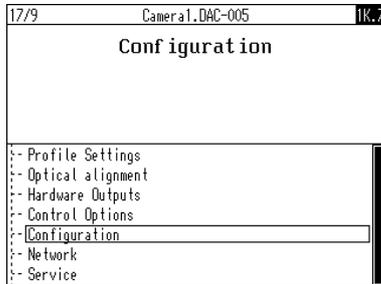
Menu 1y.6.3.N **(N) P4**



Note:

Deactivated profiles cannot be selected via the F4 key in the user level.

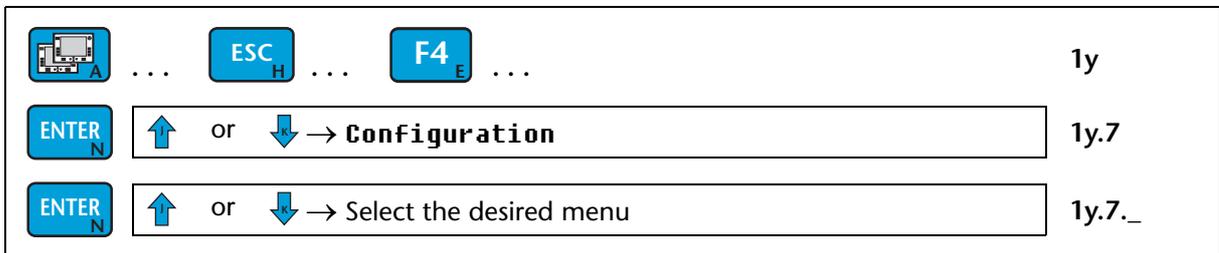
## Menu 1y.7 Configuration



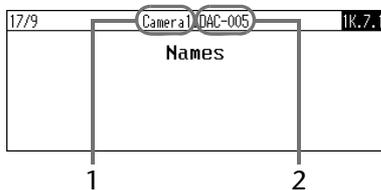
The *Configuration* section includes a list of menus containing information about the DAC-005 camera. This information is required when ordering replacement parts or for service inquiries.

### Menu

- Key sequence for the menus:



### Menu 1y.7.1 Names

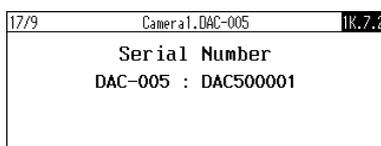


The names of devices (1) and usages (2) can be entered or changed.

Menu 1y.7.1.1 **Device**

Menu 1y.7.1.2 **Usage**

### Menu 1y.7.2 Serial Number



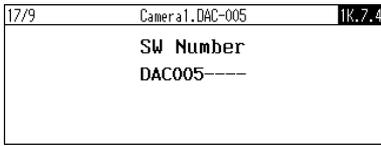
Displays the serial number of the DAC-005 camera

### Menu 1y.7.3 FW Number



Displays the firmware number of the DAC-005 camera

**Menu 1y.7.4 SW Number**



Displays the software number of the DAC-005 camera

## Menu 1y.7.5 Distributed System

Comprehensive information on this can be found in the D-MAX operating instructions in the *Menu 1y.7.5. Distributed System* section.

## Menu 1y.7.7 Backup

You can use the *Backup* menu to save all current user settings of the DAC-005 camera to a backup copy in the module.

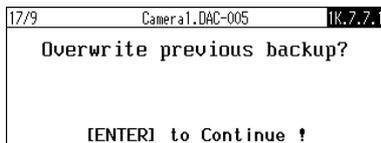
### Menu

- Key sequence for menu **1y.7.7**:

	...		...		...	1y
			or		→ <b>Configuration</b>	1y.7
			or		→ <b>Backup</b>	1y.7.7



- Start the *backup* process



### Menu 1y.7.7.1: **Overwrite previous backup?**



**Note:**

If a backup has already been saved, the old values will be overwritten by the current ones.



or



- Save the backup or exit the menu

## Menu 1y.7.8 Restore

You can use the *Restore* menu to adjust all settings of the DAC-005 camera to the values of a backup copy.

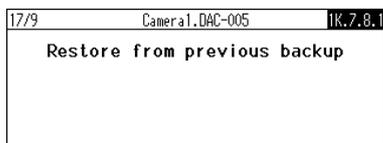
### Menu

- Key sequence for menu **1y.7.8**:

	...		...		...	1y
	↑ or ↓ → <b>Configuration</b>					1y.7
	↑ or ↓ → <b>Restore</b>					1y.7.8



- Enable the parameter for processing



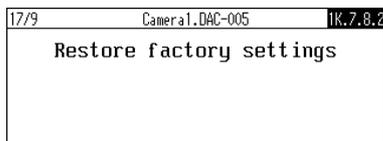
### Menu 1y.7.8.1: **Restore from previous backup**

The settings from a backup saved by the customer are restored.



Note:

If a backup has not yet been performed on the camera, this menu is not available.



### Menu 1y.7.8.2: **Restore factory settings**

The saved factory settings are restored.



Note:

This process must only be performed when it has been authorised following consultation with an employee of Fife-Tidland GmbH.



Note:

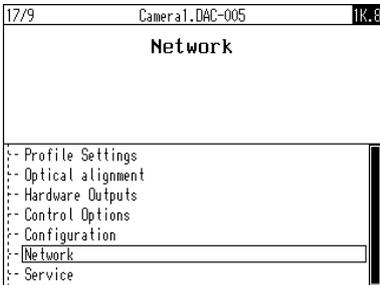
If nothing appears on the display of the operating device after a restart, a "device" must be selected with the A key.



Note:

Commissioning of the DAC-005 must be performed subsequently.

## Menus 1y.8 Network



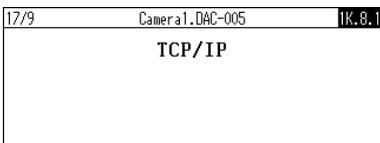
You can use these menus to view network settings and make changes to them.

### Menu

- Key sequence for the menus:

	...		...		...	1y
		or		→	Network	1y.8
		or		→	Select the desired menu	1y.8._

### Menu 1y.8.1 TCP/IP



Display and change the following parameters:

- Menu 1y.8.1.1 **IP-Address**
- Menu 1y.8.1.2 **Subnet Mask**
- Menu 1y.8.1.3 **Gateway**
- Menu 1y.8.1.4 **DHCP**

### Menu 1y.8.2 MAXNET



Internal Addressing

Menu 1y.8.2.1 **MAXNET Address**

The MAXNET address is used to address individual D-MAX devices.

1y.8.2.2 **MAXNET Cluster** menu (optional)

The MAXNET cluster is used

- to operate identical systems in a network
- to operate more than 31 devices in a network



Note:

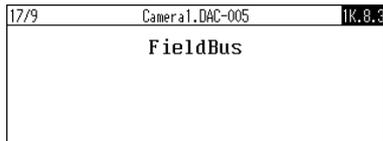
This address should only be changed after referring to the relevant instructions in a set of "Supplementary Operating Instructions" (see system documentation) or after consulting with an employee of Fife-Tidland GmbH.



Note:

If nothing appears on the display of the operating device after a restart, a "device" must be selected with the A key.

### Menu 1y.8.3 FieldBus (optional)



Display of FieldBus Characteristics

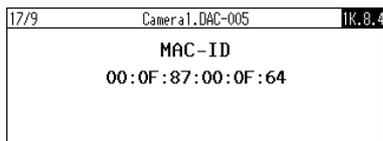
Menu 1y.8.3.1 **FieldBus Type**

Menu 1y.8.3.2 **FieldBus State**

Menu 1y.8.3.3 **FieldBus Data**

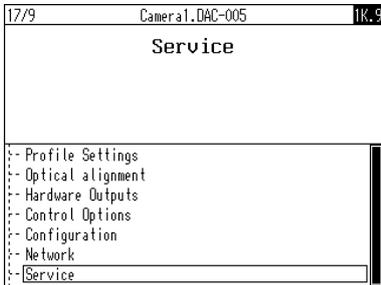
For the meaning of the data, please refer to the "Supplementary Operating Instructions" in the system documentation.

### Menu 1y.8.4 MAC-ID



Displays the serial number of the DAC-005 camera

## Menus 1y.9 Service



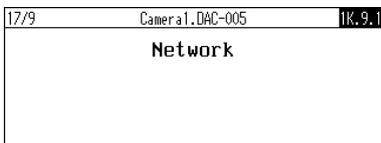
The purpose of these menus is to show information about settings of the DAC-005 camera that is important for Customer Service.

### Menu

- Key sequence for the menus:

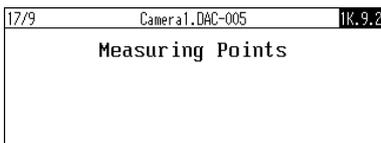
 ...  ...  ...	1y
  or  → <b>Service</b>	1y.9
  or  → Select the desired menu	1y.9._

## Menu 1y.9.1 Network



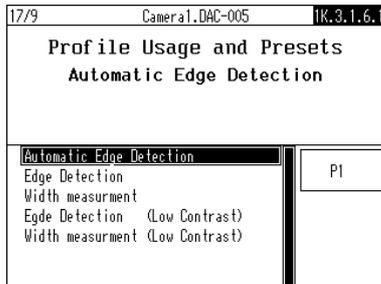
Display of "devices" present in the network

## Menu 1y.9.2 Measuring Points



Display of DAC-005 camera values  
Menu 1y.9.2.1 **Input Voltage**  
Menu 1y.9.2.2 **Sensors**

## 8 APPLICATION EXAMPLES



In [Menu 1y.3.1.6 Profile Usage and Presets, page 7-12](#), the task that the DAC-005 camera must perform in the customer's system is selected.

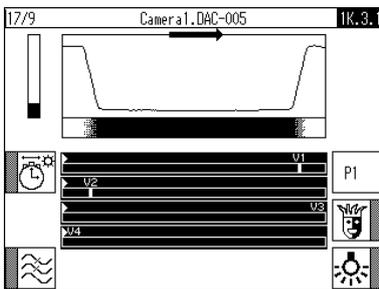
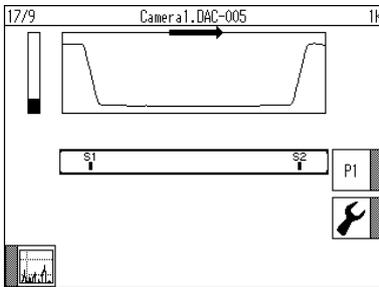
This section describes the possible uses of the DAC-005 camera and the presets that these may require.



**Note:**

If the camera is using software modified to customer-specific requirements, the [Menu 1y.3.1.6 Profile Usage and Presets](#) menu is not available and the examples for use given here are not possible.

## Automatic edge detection



### Typical application:

- Web edge guiding for opaque material webs
- Illumination is positioned opposite the camera, on the other side of the material web (back light application).
- The two strongest edges (light-dark and dark-light) of the field of view are searched for.

### Preset settings:

The following parameters are preset with the specified values for this application:

- Exposure time:** Automatic  
Selecting the automatic exposure time means that the camera image is not overexposed and the video signal is not saturated.
- Filter size:** 64 pixels  
A filter size of 64 pixels should prevent dirt on the lamp being detected as an edge. Of course, this is only true for such time that a change in contrast caused by dirt is less than the change in contrast of the material web.
- Joker: Lost edge substitution value:** Standard  
The joker is set so that if the material web is lost, it is fed back into the camera's field of view.
- Light source (optional):** Internal blue illumination  
The preset light source is the internal blue illumination.

### Signals:

The S1 and S2 signals are the sources for the analogue outputs.

S1 signal: The first edge in the scanning direction

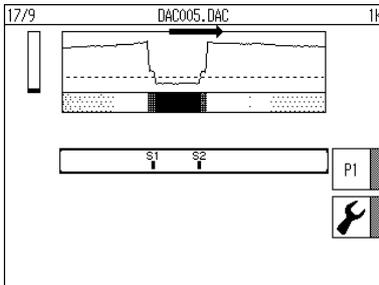
S2 signal: The first edge against the scanning direction

### Implementation:

- The V1 virtual sensor seeks the most prominent dark-light transition in the evaluation direction
- The V2 virtual sensor seeks the most prominent light-dark transition in the evaluation direction
- The V3 virtual sensor forms the joker value (lost edge substitution value) for the S1 signal

- The V4 virtual sensor forms the joker value (lost edge substitution value) for the S2 signal

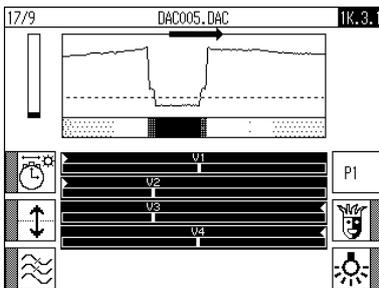
## Edge detection



### Typical application:

- Web edge guiding for an opaque material on a partially transparent carrier material
- The guiding takes place on the opaque material.
- Illumination is positioned opposite the camera, on the other side of the material web (back light application).

"Automatic edge detection" cannot be used since the interesting transition from partially transparent carrier material to opaque material web exhibits a lower contrast than the transition from the background illumination to the partially transparent carrier material. The threshold must therefore be set up in such a way that the desired edges in the field of view used for guiding.



### Preset settings:

The following parameters can be set for this application:

-  **Exposure time:** Automatic  
Selecting the automatic exposure time means that the camera image is not overexposed and the video signal is not saturated.
-  **Threshold:** 43%  
The threshold is 50% of the target illumination time value. This is 43% of the dynamic range.
-  **Filter size:** 0pixels  
A filter size of 0pixels ensures a maximum edge steepness. If unwanted interference occurs in the signal, this value can be increased to produce better results.
-  **Joker: Lost edge substitution value:** Standard  
The joker is set so that if the material web is lost, it is fed back into the camera's field of view.
-  **Light source (optional):** Internal blue illumination  
The preset light source is the internal blue illumination.

### Signals:

The S1 and S2 signals are the sources for the analogue outputs.

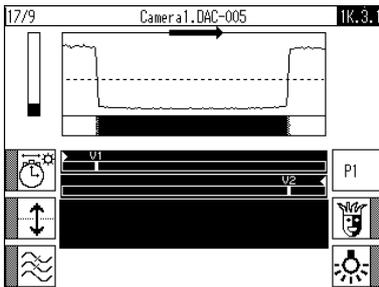
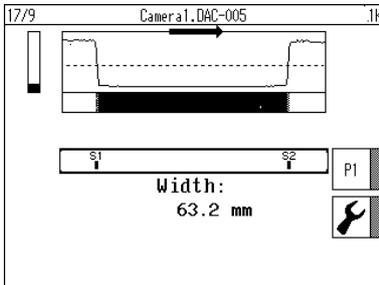
S1 signal: The first edge in the scanning direction

S2 signal: The first edge against the scanning direction

**Implementation:**

- The V1 virtual sensor seeks the first dark-light transition in the evaluation direction
- The V2 virtual sensor seeks the first light-dark transition in the evaluation direction
- The V3 virtual sensor seeks the first dark-light transition in the evaluation direction
- The V4 virtual sensor seeks the first light-dark transition in the evaluation direction

## Width measurement



### Typical application:

- Measurement of the web width of an opaque material web with a camera, including the web edges or web centre guiding
- Illumination is positioned opposite the camera, on the other side of the material web (back light application).

### Preset settings:

The following parameters can be set for this application:

-  **Exposure time:** Automatic  
Selecting the automatic exposure time means that the camera image is not overexposed and the video signal is not saturated.
-  **Threshold:** 43%  
The threshold is 50% of the target illumination time value. This is 43% of the dynamic range. This value should not be changed for width measurement.
-  **Filter size:** 0pixels  
A filter size of 0pixels ensures a maximum edge steepness and the best possible accuracy for width measurement.
-  **Joker:** Lost edge substitution value: Standard  
The joker is set so that if the material web is lost, it is fed back into the camera's field of view.
-  **Light source (optional):** Internal blue illumination  
The preset light source is the internal blue illumination.



### Note:

For width measurement, the camera must be calibrated (see [Menu 1y.4.3 Calibration, page 7-16](#)).

If no calibration data is available, a web width of 0mm is displayed.

### Signals:

The S1 and S2 signals are the sources for the analogue outputs. The width is determined and displayed from S1 and S2 with the help of the calibration data.

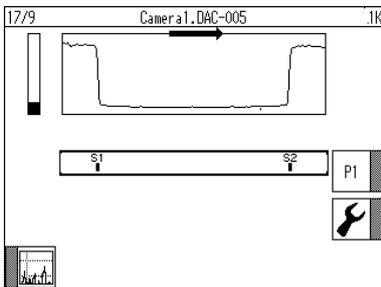
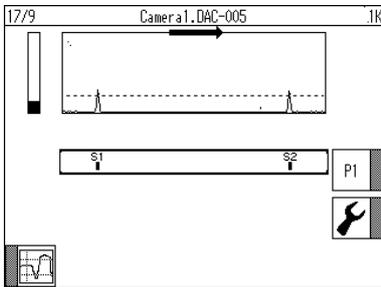
S1 signal: The first falling edge in the scanning direction

S2 signal: The first falling edge against the scanning direction

### Implementation:

- The V1 virtual sensor seeks the first light-dark transition in the evaluation direction
- The V2 virtual sensor seeks the first light-dark transition in the evaluation direction

## Edge detection - low contrast



### Typical application:

- Web edge guiding for a material that absorbs little light in a clean environment
- Illumination is positioned opposite the camera, on the other side of the material web (back light application).

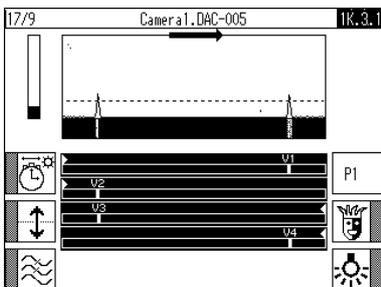
Because the brightness gradient is not a straight line, it is not always possible to use the brightness signal for edge detection. The contrast signal is therefore used for the evaluation.

This figure shows the same example with the brightness signal.



### Note:

To ensure reliable operation of the camera when the field of view is completely covered by the material web or, for example, in the event of a web break (no material web in the field of view), the "ASC" menu must also be configured on the web guide controller.



### Preset settings:

The following parameters can be set for this application:

 **Exposure time:** Automatic  
Selecting the automatic exposure time means that the camera image is not overexposed and the video signal is not saturated.

 **Threshold:** 9.6%  
The threshold is 9.6% of the dynamic range of the contrast signal.

 **Filter size:** 8pixels  
A filter size of 8pixels generates the contrast signal. Under certain circumstances, increasing this value can improve the signal-to-noise ratio. The value should be adjusted accordingly.

 **Joker: Lost edge substitution value:** Standard  
If no web edge is detected by the camera in the field of view, a defined extreme value is output that can be inverted in [Menu 1y.3.1.5 Joker: Lost Edge substitution value, page 7-11](#).



*Light source (optional):* Internal blue light source

The preset light source is the internal blue illumination.

### Signals:

The S1 and S2 signals are the sources for the analogue outputs.

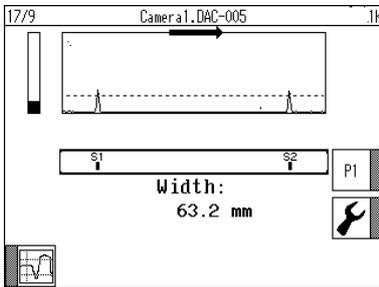
S1 signal: The first edge in the scanning direction

S2 signal: The first edge against the scanning direction

### Implementation:

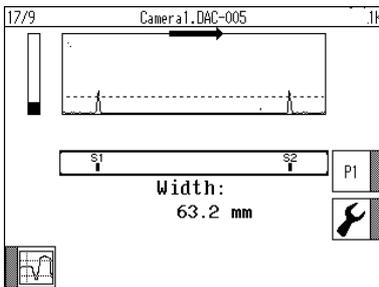
- The V1 virtual sensor seeks the first dark-light contrast in the evaluation direction
- The V2 virtual sensor seeks the first light-dark contrast in the evaluation direction
- The V3 virtual sensor seeks the first dark-light contrast in the evaluation direction
- The V4 virtual sensor seeks the first light-dark contrast in the evaluation direction

### Width measurement - low contrast



#### Typical application:

- Measurement of the web width of an transparent material web with a camera, including the web edges or web centre guiding
- Illumination is positioned opposite the camera, on the other side of the material web (back light application).

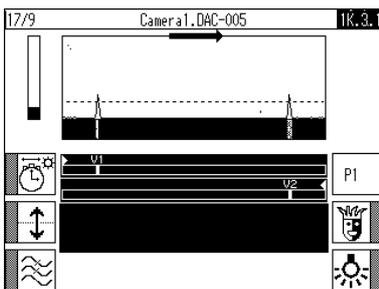


This figure shows the same example with the brightness signal.



#### Note:

To ensure reliable operation of the camera when the field of view is completely covered by the material web or, for example, in the event of a web break (no material web in the field of view), the "ASC" menu must also be configured on the web guide controller.



#### Preset settings:

The following parameters can be set for this application:

- Exposure time: Automatic**  
Selecting the automatic exposure time means that the camera image is not overexposed and the video signal is not saturated.
- Threshold: 9.6%**  
The threshold is 9.6% of the dynamic range of the contrast signal.
- Filter size: 8 pixels**  
A filter size of 8 pixels generates the contrast signal. This is a compromise between a good signal-to-noise ratio and a high level of accuracy for the width measurement.



*Joker: Lost edge substitution value: Standard*

If no web edge is detected by the camera in the field of view, a defined extreme value is output that can be inverted in [Menu 1y.3.1.5 Joker: Lost Edge substitution value, page 7-11](#).



*Light source (optional): Internal blue light source*

The preset light source is the internal blue illumination.



Note:

The camera must be calibrated for width measurement (see [Menu 1y.4.3 Calibration, page 7-16](#)).

If no calibration data is available, a web width of 0mm is displayed.

#### Signals:

The S1 and S2 signals are the sources for the analogue outputs. The width is determined and displayed from S1 and S2 with the help of the calibration data.

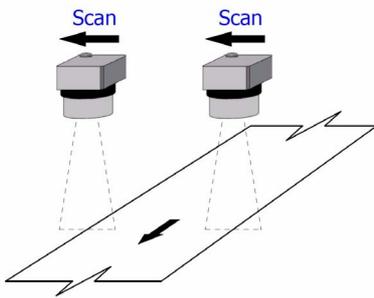
S1 signal: The first falling edge in the scanning direction

S2 signal: The first falling edge against the scanning direction

#### Implementation:

- The V1 virtual sensor seeks the first light-dark contrast in the evaluation direction
- The V2 virtual sensor seeks the first light-dark contrast in the evaluation direction

## 2 cameras



### Typical application:

- Web centre guiding for material webs via two cameras, each of which detects an edge
- Optional web width measurement

### Requirement:

- In terms of their physical sensor direction, the cameras must be installed in the system in accordance with the specifications in the customer drawing.



### Note:

If a camera cannot be installed in accordance with the customer drawing, the sensor direction of this camera must be adjusted virtually (see [Menu 1y.4.6 Rotate mounting direction virtually, page 7-23](#)).

- The cameras must be connected on the web guide controller in accordance with the information in the system diagram.

### Web centre guiding:

1. If specified in the "Supplemental Operating Instructions" (part of the system documentation), each camera must be calibrated individually (see [Menu 1y.4.3 Calibration, page 7-16](#)).

### Web width measurement (optional):

1. Each camera must be calibrated individually (see [Menu 1y.4.3 Calibration, page 7-16](#)).
2. The positions of the two cameras in relation to each other must be set up:
  - Place a piece of test material with a known width in the centre of both cameras' field of view
  - Open and edit the [Menu 1y.4.4 Calibrate Camera Position, page 7-19](#)  
Half of the material web width is entered as the edge position in each case. This means that each camera is assigned a position in relation to the centre of the material web. The width of the material web can then be calculated.

## 9 MAINTENANCE

The following maintenance tasks must be performed at regular intervals, depending on the ambient level of contamination from dirt and dust and fluctuations in temperature.

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### Camera

#### Desiccant cartridge:

- Replace when pink in colour

#### Glass on protective tube:

- Clean with a soft lint-free cloth



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#### CAUTION:

⇒ Do not use any corrosive cleaning agents.

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### Measuring field lamp

- Clean with a soft lint-free cloth



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#### CAUTION:

⇒ Do not use any corrosive cleaning agents.

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## 10 TROUBLESHOOTING

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### Information

The DAC-005 camera is capable of detecting errors that occur. If a D-MAX operator interface is present in the system, error messages can be viewed on its display.

### Display possibilities

If an error occurs, the following displays must be checked:

- Information in the display of the D-MAX operator interface when the unit is present
- The display on the web guide controller

### Procedure

If an error occurs, the following items must be checked:

1. The D-MAX operator interface
2. The settings on the web guide controller

## Faults

Malfunction	Cause	Remedy
Exposure time shows extreme fluctuations.	The web covers the entire field of view except for a small part at the beginning of the physical scanning direction. This means that there is a small spot of light at the start of the field of view.	Limit the maximum exposure time (see <a href="#">Menu 1y.3.1.2 Exposure Time, page 7-7</a> ).
The video signal is at the upper end of the display and the exposure time bar is at a minimum.	The camera is over-exposed because the aperture has been opened too far.	Close down aperture (see <a href="#">Set the aperture, page 4-6</a> ).
The video signal is at the lower end of the display and the exposure time bar is at a maximum.	The camera is under-exposed because the aperture has been closed down too far.	Open aperture (see <a href="#">Set the aperture, page 4-6</a> ).
The video signal shows a brightness peak and the exposure time bar is at a minimum when the internal light source is used.	There is a bright point of light on the material or the camera is taking in extraneous light.	Determine and remove the source of extraneous light.
The video signal shows an extreme drop at the left or right end of the oscilloscope display (see <a href="#">Figure 4.4, page 4-3</a> ).	The camera is not aligned parallel to the measurement field lamp.	Align camera mechanically (see <a href="#">Assembly, page 3-2</a> ).

**Error message on D-MAX operator interface**

Message	Cause	Remedy
Wrong calibration gauge	No calibration gauge or wrong calibration gauge inserted.	Insert correct calibration gauge.
	Video signal is not suitable for calibration.	<p>Check video signal. Either two (ancillary gauge) or six (bar calibration gauge) valid calibration points must be determined.</p> <p>Reasons for bad video signals:</p> <ul style="list-style-type: none"> <li>– Over-exposure: Check exposure time</li> <li>– Edge area excluded too large (see <a href="#">Menu 1y.4.5 Exclude outer areas, page 7-21</a>)</li> </ul>
Calibration gauge too inexact	Wrong calibration gauge with differing spaces between the bars or interference in the video signal.	<p>Insert correct calibration gauge</p> <p>Check video signal, see above.</p>
No reference edge in the field of view	No edge for position determination in the field of view.	<p>Insert the position gauge correctly</p> <p>Only one edge must be visible.</p>
More than one reference edge in the field of view	Too many edges for position determination in the field of view.	<p>Insert the position gauge correctly</p> <p>Only one edge must be visible.</p>
Other		Contact Fife-Tidland GmbH (see <a href="#">Service, page 15-1</a> )

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# 11 TECHNICAL DATA

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## General information

<b>Casing</b>	Nickel-plated aluminium
<b>Covering window</b>	Glass
<b>Housing dimensions</b>	<ul style="list-style-type: none"><li>- C-Mount: Length = 140mm Width = 99.5mm Height = 105mm</li><li>- F-Mount: Length = 140mm Width = 99.5mm Height = 250mm</li></ul>
<b>Weight</b>	<ul style="list-style-type: none"><li>- C mount: 1.23kg</li><li>- F mount: 2.11kg</li></ul>
<b>Protective system</b>	IP-65
<b>Ambient conditions</b>	Operating temperature: 0°C ... 50°C, Relative humidity: up to 90% non-condensing Altitude above sea level: maximum 3000m
<b>Internal light source</b>	LED with wavelength 630nm, 525nm, 460nm

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## Electrical connection

### X1 plug connector

for Ethernet, M12 socket, 4-pin, D-coded

Pin	Description
1	Tx+
2	Rx+
3	Tx-
4	Rx-
Casing	Shield

### X2 plug connector

for power supply and analogue outputs, M12 connector, 8-pin, A-coded

Pin	Description
1	Uv+
2	analogue output 2
3	GND
4	analogue output 1
5	OI-S-
6	OI-S+
7	digital output 1
8	digital output 2
Casing	Shield

### Output signals

- Analogue signal: 0 to 10mA, maximum permissible load: <250Ohm
- Digital signal: Open collector switching to ground, maximum 30V, 55mA at 1.6V, over-current and short-circuit protection

## Digital output matrix

Status	Outputs	
	1*	2*
Lamp dirty	1	-

\* Parallel outputs are active Low  
 1 = Active  
 - = Any

The polarity and delay can be set in the respective menu options (see ["Menu 1y.5.1.\\_1 Delay" on page 7-26](#) or ["Menu 1y.5.1.\\_2 Polarity" on page 7-27](#)).

## Power supply Uvx

The system provided is optimised for the required application in terms of the electrical connection of the DAC-005 camera. Changes to this application may result in an alternative connection for the camera and should therefore always be discussed with Fife-Tidland GmbH.

## Power supply through the web guide controller

Power supply	Comment
Through D-MAX	with internal light source maximum 1 camera per D-MAX
	without internal light source maximum 2 cameras per D-MAX
Through DP-30	with internal light source maximum 1 camera per DP-30
	without internal light source maximum 2 cameras per DP-30
Through DP-20	with internal light source maximum 1 camera per DP-20
	without internal light source maximum 1 camera per DP-20

Nominal value: 12V  
 Current consumption: <400mA with internal light source  
 <300mA without internal light source

Cable lengths when analogue output signals are used:  
15m with internal light source  
20m without internal light source

**External power supply**

Power supply	Comment
Through additional 12V power source	with internal light source
	without internal light source

Nominal value: 12V  
Current consumption: <400mA with internal light source  
<300mA without internal light source

Cable lengths when analogue output signals are used:  
15m with internal light source  
20m without internal light source

Power supply	Comment
Through additional 24V power source	without internal light source

Nominal value: 24V  
Current consumption: <160mA without internal light source

Cable lengths when analogue output signals are used:  
35m without internal light source

## Name plate

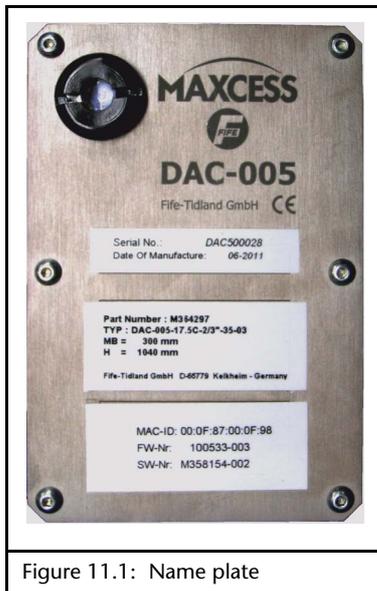


Figure 11.1: Name plate

Designation	Explanation
Serial no.	Serial number
Date of manufacture	Date of manufacture
Part number	Part number
Type	Type designation
MB	Width of the sensor field of view
H	Clearance of the camera rear to the middle of the measuring light field
Fife-Tidland GmbH 65779 Kelkheim, Germany	Manufacturer's address
MAC ID	MAC address
FW no.	Firmware number
SW no.	Software number

## Standards and regulations

The DAC-005 camera has been constructed in accordance with the standards and regulations of the European Union.

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## 12 DECOMMISSIONING

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### Decommissioning

1. Turn off the electrical power to the camera.
2. Remove all cables.
3. The camera must be dismantled as described in the Dismounting section.
4. The camera may be stored according to the given environmental conditions (see [Transport and storage, page 3-1](#)).

OR

The camera must be disposed of in accordance with national regulations.

## 13 MENU STRUCTURE

### Key



The menu is only present when the customer software has been programmed accordingly.



A numeric entry follows.



A list from which the entries can be selected follows.

ENTER

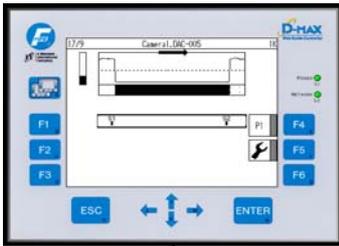
Switch to the lower menu level and save entries.



Move between the menus in a level using the "Up arrow" and "Down arrow" keys.

<sup>1</sup> Optional

<sup>2</sup> The *Set up camera position* menu is only available when calibration has been performed.



ENTER



P

1y.2 Remote Control

ENTER



1y.3 Profile Settings

ENTER

continued on page 13-3

- Threshold<sup>1</sup>
- Exposure Time
- Filter Size<sup>1</sup>
- Light Source<sup>1</sup>
- Joker: Lost Edge substitution value<sup>1</sup>
- Profile Usage and Presets<sup>1</sup>

1y.4 Optical alignment

ENTER

- Adjust Optic
- Brightness Correction
- Calibration
- Calibrate Camera Position<sup>2</sup>
- Exclude outer areas
- Rotate mounting direction virtually
- Lens Type

1y.5 Hardware Outputs

ENTER

continued on page 13-4

- Digital Outputs
- Simulate Analog Signals

1y.6 Control Options

ENTER

- Length Unit
- Enable/Disable Profiles

1y.7 Configuration

ENTER

- Names
- Serial Number
- FW Number
- SW Number
- Distributed System

1y.8 Network

ENTER

- Backup
- Restore

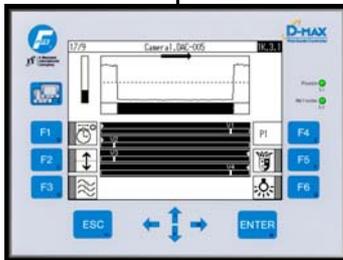
1y.9 Service

ENTER

- TCP/IP
- MAXNET
- FieldBus<sup>1</sup>
- MAC-ID

- Network
- Measuring Points

xy.3  
Profil Settings



ENTER



1y.3.1.1  
Threshold<sup>1</sup>

ENTER —

1y.3.1.2  
Exposure Time

ENTER —

1y.3.1.3  
Filter Size

ENTER —

1y.3.1.4  
Light Source<sup>1</sup>

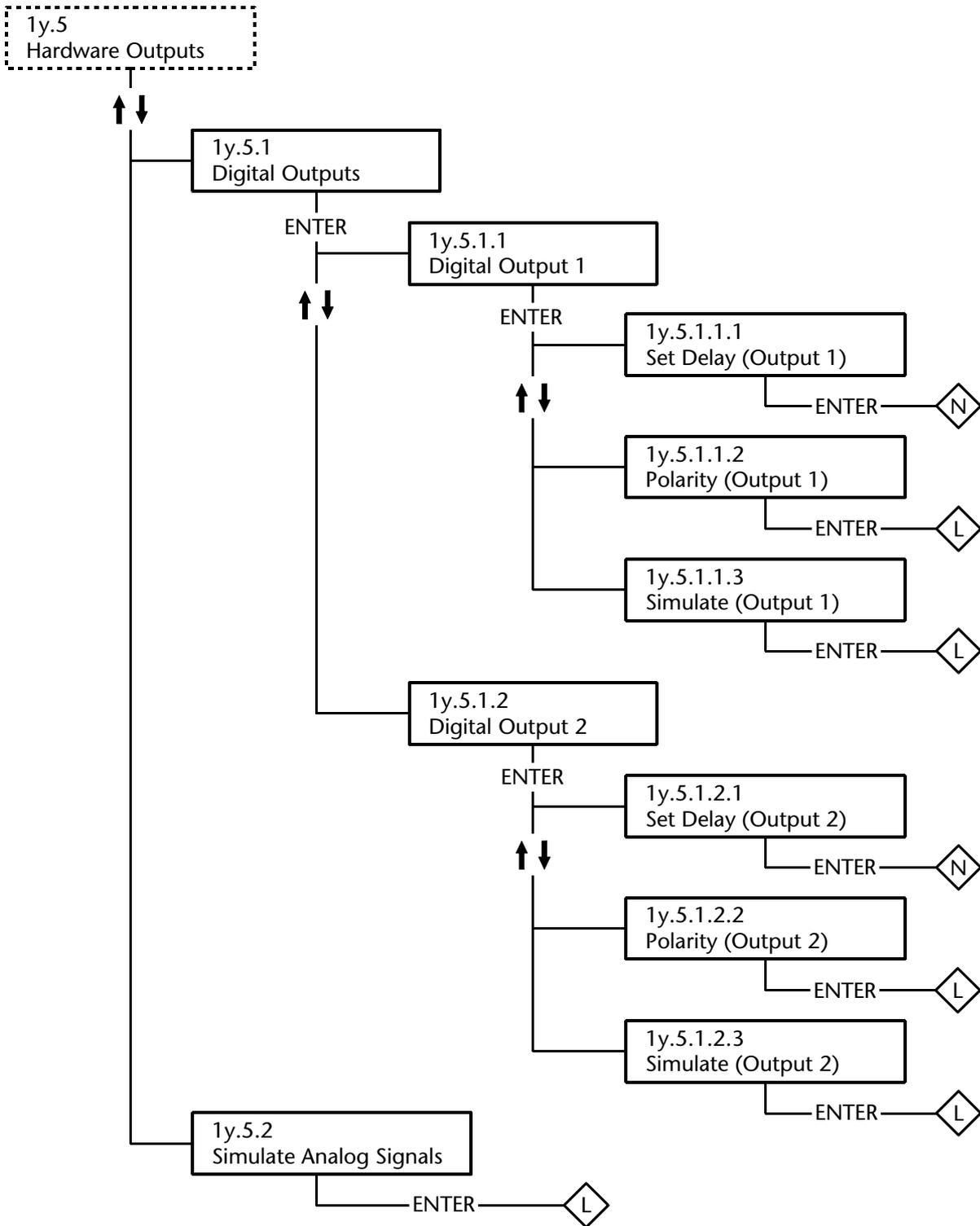
ENTER —

1y.3.1.5  
Joker: Lost Edge substitution value<sup>1</sup>

ENTER —

1y.3.1.6  
Profile Usage and Presets<sup>1</sup>

ENTER —



## 14 OPTIONAL OI-S OPERATOR INTERFACE

### Use

The optional OI-S operator interface is used to display the status and can help to set up the DAC-005 mechanically and optically in a system.

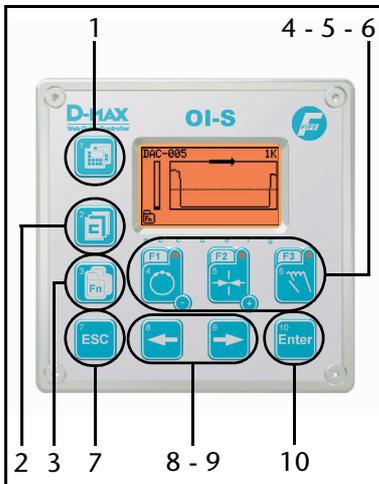


### Note

All safety instructions as well as information on installation, operation and maintenance of the OI-S D-MAX operator interface can be found in the "D-MAX/OI-S" operating instructions.

### Operation

#### Buttons



Button 1: - No function

Button 2: - Select profile

Button 3: - Switch to Fn menus

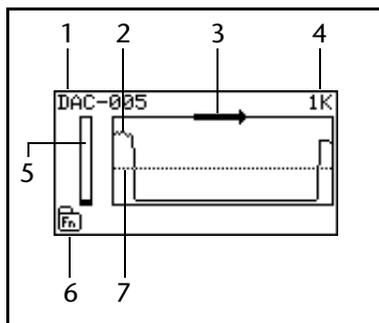
Buttons 4 - 5 - 6: - Assign the buttons (F1, F2, F3) with button 3

Button 7: - Cancel entry and exit menus

Buttons 8 - 9: - Change values in the menus

Button 10: - Save entries

#### Display



1 Camera name

2 Signal display

3 Virtual scanning direction

4 Menu identification

5 Illumination time

6 Fn symbol

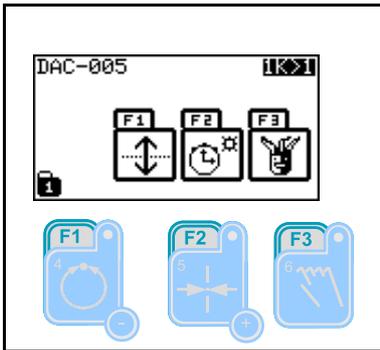
7 Threshold

## Fn menus



- Press the Fn key to switch to the Fn menus

Pressing the Fn key again will display another page of the Fn menus or return you to the user level



The following menus are available on the OI-S operator interface:

- Threshold (optional)  
see also [Page 7-6](#)
- Exposure time  
see also [Page 7-7](#)
- Joker: Lost edge substitution value (optional)  
see also [Page 7-11](#)
- Adjust optic  
see also [Page 7-14](#)
- Information!  
see also [Page 7-30](#)
- Display serial number  
see also [Page 7-30](#)
- Display firmware number  
see also [Page 7-30](#)
- Display software number  
see also [Page 7-31](#)
- Remote control (optional)  
see also [Page 7-3](#)



- Press the assigned F-key and edit the desired menu

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## 15 SERVICE

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### Requests for Service

When requesting service, please have a copy of the order confirmation ready with the order number.

When ordering replacement parts, please indicate, (where possible) Part Number, Drawing Number and Model description.

Please be careful to keep all documents accompanying the product in a safe place. This will allow us to help you more quickly in the event that service is required.

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### Addresses

To request service, or if you need replacement parts, please contact one of the following addresses.

**Fife-Tidland GmbH**

Max-Planck-Straße 8-10      Siemensstraße 13-15

65779 Kelkheim

48683 Ahaus

Deutschland

Deutschland

Telefon: +49 - 6195 - 7002 - 0

Fax: +49 - 6195 - 7002 - 933

Web: [www.maxcess.eu](http://www.maxcess.eu)

**Fife Corporation**

Post Office Box 26508

Oklahoma City, OK 73126, USA

Telefon: +1 - 405 - 755 - 1600

Fax: +1 - 405 - 755 - 8425

Web: [www.maxcessintl.com](http://www.maxcessintl.com)

