

Instruction Manual  
**eddyNCDT 3300/3301**

ES04  
EU05  
ES08  
EU1  
ES1  
ES2

EU3  
ES4  
EU6  
EU8  
EU15  
EU22

EU40  
EU80

Non-contact displacement measurement system

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Certified acc. to DIN EN ISO 9001: 2008

Software Version: V1.2

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## 1. Safety

The handling of the system assumes knowledge of the instruction manual.

### 1.1 Symbols Used

The following symbols are used in this instruction manual:

 <b>CAUTION</b>	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
<b>NOTICE</b>	Indicates a situation which, if not avoided, may lead to property damage.
	Indicates a user action.
	Indicates a user tip.

### 1.2 Warnings



Connect the power supply and the display/output device in accordance with the safety regulations for electrical equipment.

- > Danger of injury by electrical shock
- > Damage to or destruction of the sensor and/or controller

#### NOTICE

The power supply may not exceed the specified limits.

- > Damage to or destruction of the sensor and/or controller.

Avoid banging and knocking the controller or the sensor.

- > Damage or destruction of the controller and/or the sensor

Protect the cables against damage

- > Failure of the measuring device

### 1.3 Notes on CE Identification

The following applies to the measuring system:

- EMC directive 2004/108/EC
- EMC directive 2011/65/EU, "RoHS" category 9

Products which carry the CE mark satisfy the requirements of the quoted EMC directives and the standards (EN) listed therein.

The EC declaration of conformity is kept available according to EC regulation, article 10 by the authorities responsible at

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The system is designed for use in industry and satisfy the requirements of the standards

- DIN EN 61326-1: 2006-10
- DIN 61326-2-3: 2007-05

The systems satisfy the requirements if they comply with the regulations described in the instruction manual for installation and operation.

#### **1.4 Proper Use**

- The system is designed for use in industrial areas.
- It is used
  - displacement, distance, thickness and movement measurement
  - position measuring of parts or machine components
- The system may only be operated within the limits specified in the technical data, see Chap. 2.4.
- The system should only be used in such a way that in case of malfunction or failure personnel or machinery are not endangered.
- Additional precautions for safety and damage prevention must be taken for safety-related applications.

#### **1.5 Proper Environment**

- Operating temperature
  - Sensor, sensor cable: -50 to +200 °C (-58 to +392 °F), sensor specific
  - Controller: +5 to +50 °C (+41 to +122 °F)
- Storage temperature
  - Sensor, sensor cable: -25 to +150 °C (-13 to +302 °F)
  - Controller: -25 to +75 °C (-13 to +167 °F)
- Humidity: 5 - 95 % (no condensation)
- Ambient pressure: atmospheric pressure
- EMC: Acc. to
  - DIN EN 61326-1: 2006-10
  - DIN 61326-2-3: 2007-05

## 2. System Description

### 2.1 Measurement Principle

The eddyNCDT330x (Non-Contacting Displacement Transducers) measurement system operates on the basis of eddy currents without making physical contact. It is used for measurements on objects consisting of electrically conducting materials which can have ferromagnetic or non-ferromagnetic properties.

High frequency alternating currents flow through a coil cast in a sensor housing. The electromagnetic field from the coil induces eddy currents in the electrically conducting measurement object, causing the alternating current resistance of the coil to change. This change of impedance delivers an electrical signal proportional to the distance of the measurement object from the sensor.

The controller conditions the sensor signals ready for the user. The local linearization is simplified with an integral micro-controller. Optimum accuracy is achieved for each metal measurement object and each mounting environment.

The measurements are output both as a voltage and a current and also in metric units or in a graphical display.

The functions are extended to include limit monitoring, autozero, peak-peak value, minimum, maximum, mean and selectable output low-pass filters.

- The eddy current measurement principle is suitable both for ferromagnetic and non-ferromagnetic materials.



Fig. 1 Single-channel measurement system eddyNCDT 330x

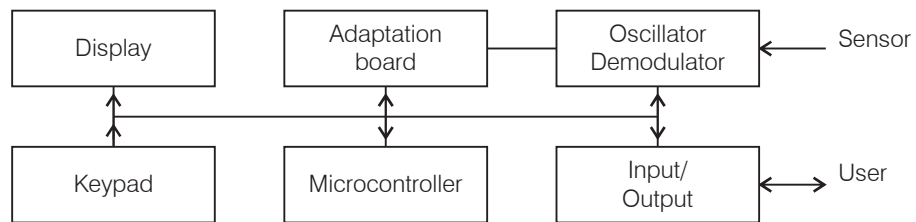


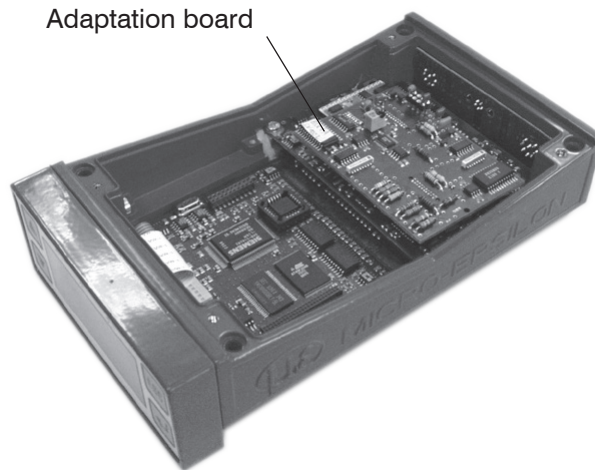
Fig. 2 Controller block diagram

### 2.2 Structure of the Measurement System

The non-contact single-channel displacement measurement system consists of:

- sensor
- sensor cable
- adaptation board <sup>1</sup>
- controller <sup>1</sup>
- signal cable
- power supply.

1) Built into a compact aluminum housing.



*Fig. 3 Interior view of the eddyNCDT 330x single-channel displacement measurement system*

The adaptation board forms the link between the sensor with its cable and the controller. It matches the various sensors to the controller. In addition, it includes the temperature compensation setting for the sensor and measurement object material.

The adaptation board is plugged onto the controller, see [Fig. 3](#) and is used for a certain

- sensor model,
- sensor cable length and
- measurement object material.

If the sensor is replaced by one of a same type or the sensor cable exchanged:

- Check the calibration and relinearize the measurement channel, if necessary, see [Chap. 5.4](#).

If the sensor is replaced by one of a different type, the sensor cable length exchanged or the measurement object material (ferromagnetic/non-ferromagnetic) changed:

- Change the adaptation board and
- Check the calibration and relinearize the measurement channel, if necessary, see [Chap. 5.4](#).

• If sensor and/or adaptation board have been changed, the factory calibration is wrong. Work with the characteristics 1 up to 3, see [Chap. 5.1.1](#).

### 2.2.1 Front View Controller

The dialog-aided operation using a LC graphical display with illumination is supported. The controller is operated with the four keys on the front, see [Fig. 4](#).

Addressable functions:

- System information
- Basic settings
- Calibration settings
- Measurement display
- Limits

Display:

- Numerical and graphical display of measurements.



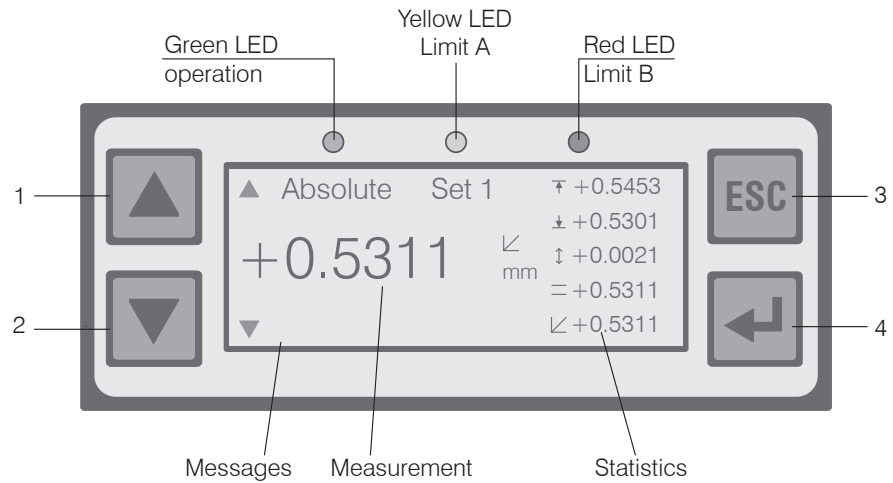


Fig. 4 Keypad and display on the front of the controller

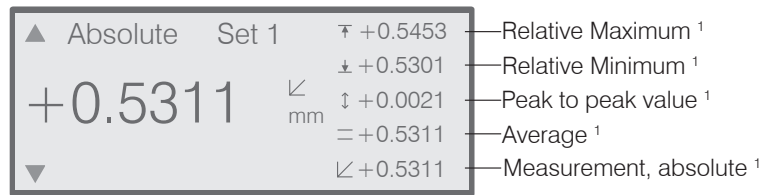


Fig. 5 Display on the front of the controller in the “Standard display” mode

The following functions are assigned to the keypad, see Fig. 4:

- (1), (2) up/down movement in menus, value input: (1) greater (2) smaller
- (3) Quitting a menu point (return by one hierarchical step), discard input
- (4) Calling a menu point or input confirmation.

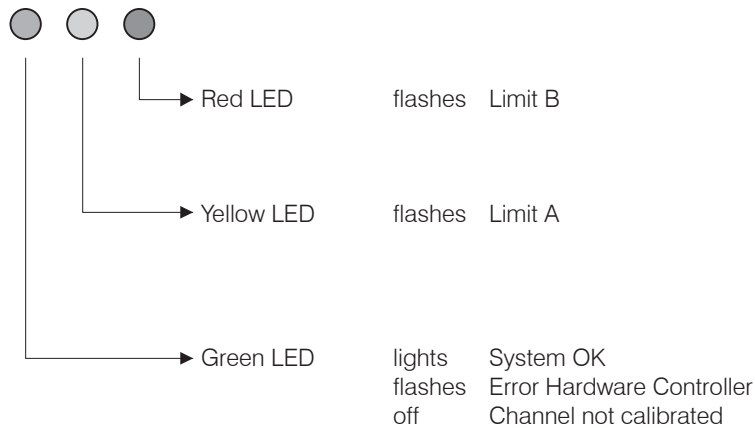


Fig. 6 LED's on the front of the controller

1) Statistics are calculated from the measurements inside the evaluation cycle, see Chap. 5.6.

### 2.2.2 Rear View Controller

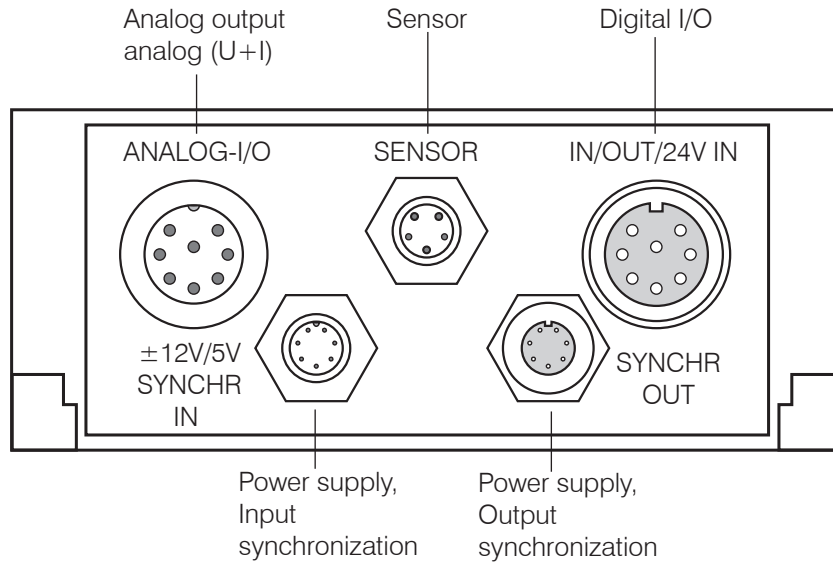
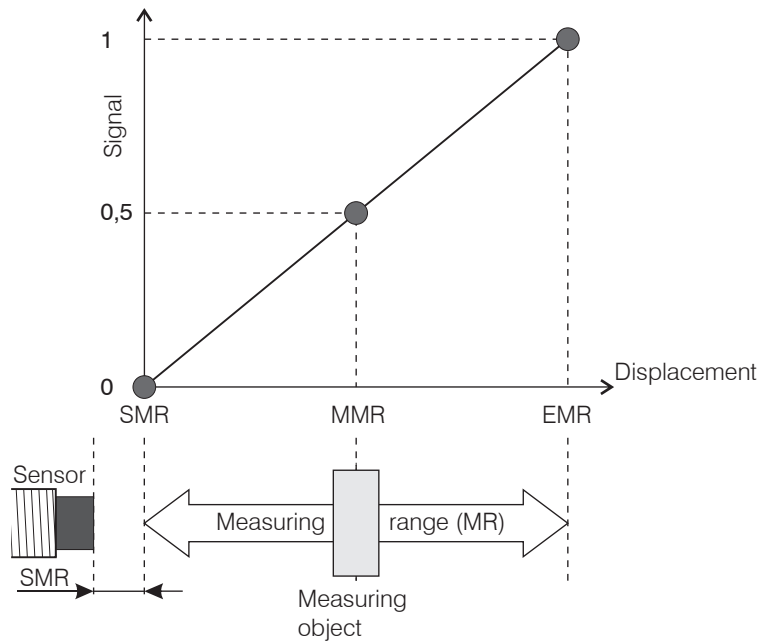


Fig. 7 Connectors on the rear side of the controller

### 2.3 Glossary

- SMR** Start of measuring range. Minimum distance between sensor front and measuring object, see Chap. 4.2.1
- MMR** Midrange
- EMR** End of measuring range (Start of measuring range + measuring range). Maximum distance between sensor front and measuring object.
- MR** Measuring range



**2.4 Technical Data**

Data apply for all sensors eddyNCDT in correspondence with controller DT330x and refer to the actual measuring range.																
Controller	Model	DT3300										DT3301				
	Power supply	± 12 VDC / 100 mA, 5.2 VDC / 220 mA <sup>1</sup>										11 - 32 VDC / 700 mA				
Sensor model		ES04	EU05	ES08	EU1	ES1	ES2	EU3	ES4	EU6	EU8	EU15	EU22	EU40	EU80	
Measuring range (MR)	mm	0.4	0.5	0.8	1	1	2	3	4	6	8	15	22	40	80	
SMR	mm	0.04	0.05	0.08	0.1	0.1	0.2	0.3	0.4	0.6	0.8	1.5	2.2	4.0	8.0	
EMR	mm	0.44	0.55	0.88	1.1	1.1	2.2	3.3	4.4	6.6	8.8	16.5	24.2	44	88	
Linearity		≤ ±0.2 % FSO														
	μm	±0.8	±1	±1.6	±2	±2	±4	±6	±8	±12	±16	±30	±44	±80	±160	
Resolution <sup>2</sup>	to 25 Hz	≤ 0.01 % FSO			≤ 0.005 % FSO											
	μm	0.04	0.05	0.04	0.05	0.05	0.1	0.15	0.2	0.3	0.4	0.75	1.1	2	4	
	to 2.5 kHz	≤ 0.01 % FSO														
	μm	0.04	0.05	0.08	0.1	0.1	0.2	0.3	0.4	0.6	0.8	1.5	2.2	4	8	
	to 25/100 kHz	≤ 0.02 % FSO														
	μm	0.8	1	1.6	2	2	4	6	8	12	16	30	44	80	160	
Frequency response		25 Hz / 2500 Hz / 25 kHz (ex factory) / 100 kHz (-3 dB) selectable for measuring ranges ≤ 1 mm 100 kHz possible also														
Temperature compensation		10 ... 100 °C (Option TCS: -40 ... 180 °C) <sup>3</sup> +50...+212 °F (Option TCS: -40...+365 °F) <sup>3</sup>														
Operating temperature	Sensor / cable	-40 ...200 °C (-40...+392 °F), (see sensor specification)														
	Controller	5 ... 50 °C ( +41...+122 °F)														
Storage temperature	Sensor / cable	-25 ... 150 °C (-13 ... +302 °F)														
	Controller	-25 ... 75 °C (-13 ... +167 °F)														
Temperature stability	Sensors	≤ ±0.015 % d.M./°C respectively ≤ ±0.025 % d.M./°C, (see sensor specification) ≤ ±0.008 % FSO/°F respectively ≤ ±0.014 % FSO/°F, (see sensor specification)														
Sensor cable length		3 m (±0.45 m) - Option: to 15 m														
Signal output		selectable option: 0 ... 5 V; 0 ... 10 V; ±2,5 V; ±5 V; ±10 V (or inverted), min. load 1 kOhm 4 ... 20 mA (Liability 350 Ohm)														
Electromagnetic compatibility (EMC)		acc. to DIN EN 61326-1: 2006-10 and DIN 61326-2-3: 2007-05														
Controller functions		Limit switches, Auto-Zero, Peak-to-Peak, Minimum, Maximum, Average, Storage of 3 configurations (calibrations)														
<p>FSO = Full-Scale Output</p> <p>The reference material are aluminum (non-ferromagnetic) and Mild Steel (St37, DIN 1.0037/AISI 4130 (ferromagnetic)).</p> <p>The quoted data applies at a reference temperature of 20 °C (70 °F); Resolution and temperature stability refer to midrange (MMR).</p> <p>Different data are possible as magnetic inhomogeneous materials.</p> <p>1) Additionally 24 VDC for external back-spacing and limit switch.</p> <p>2) Resolution data are based on noise peak to-peak values.</p> <p>3) Temperature stability can differ as option TCS.</p>																

### **3. Delivery**

#### **3.1 Supplied Items, Unpacking**

- 1 Sensor
- 1 Operating manual
- 1 Sensor cable
- 1 8 pol. DIN male plug (Digital I/O)
- 1 Test log
- 1 8 pol. DIN female plug (Analog output)
- 1 Controller with adapter board

➡ Check for completeness and shipping damage immediately after unpacking. In case of damage or missing parts, please contact the manufacturer or supplier.

#### **3.2 Storage**

- Storage temperature:
  - Sensor and cable: -25 to 150 °C (-13 to +302 °F)
  - Controller: -25 to 75 °C (-13 to +167 °F)
- Humidity: 5 - 95 % (non-condensing)

## 4. Installation and Assembly

### 4.1 Precautions

No sharp or heavy objects should be allowed to affect the cable sheath of the sensor cable, the supply cable and of the output cable. All plug-in connections must be checked for firm seating before starting operation.

### 4.2 Sensor

**Unscreened sensors, see Fig. 8**

- Type designation: EU..
- Construction: The front part of the sensor with encapsulated coil consists of electrically non-conducting materials.

**i** In the radial direction metal parts in the vicinity may behave similar to the measurement object, rendering the measurement result inaccurate. Please note this by selection of material for sensor mounting and their setup.



Fig. 8 Unscreened sensor

**Screened sensors, see Fig. 9**

- Type designation: ES..
- Construction: The sensor enclosed up to its front face with a steel housing with a mounting thread. With it the sensor is screened from interference through radially near located metal parts.



Fig. 9 Screened sensor

#### 4.2.1 Start of Measuring Range

For each sensor a minimum distance to the measurement object must be maintained. This avoids a measurement uncertainty due to the sensor pressing on the measurement object and mechanical damage to the sensor/measurement object.

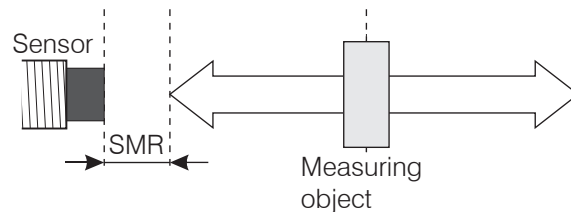


Fig. 10 Start of measuring range (SMR), the smallest distance between sensor face and measuring object.

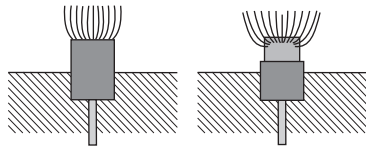
Sensor	Start of measuring range	Mounting thread M	Mounting hole B	Bolt circle C
ES04	0.04 mm	M4x0.35		
EU05	0.05 mm	M3x0.35		
ES08	0.08 mm	M5x0.5		
EU1	0.1 mm	M5x0.8		
ES1	0.1 mm	M8x1		
ES2	0.2 mm	M12x1		
EU3	0.3 mm	M12x1		
ES4	0.4 mm	M18x1		
EU6	0.6 mm	M18x1		
EU8	0.8 mm	M24x1.5		
EU15	1.5 mm			
EU22	2.2 mm		ø 4.2 mm	ø 25 mm
EU40	4.0 mm		ø 5.5 mm	ø 37 mm
EU80	8.0 mm		ø 6.5 mm	ø 80 mm

Eddy-current displacement sensors can be affected in their measurement properties by a metallic holder. Depending on the sensor type, the following sensor mounting should be preferred:

- Unscreened sensors: Standard mounting.
- Screened sensors: Flush mounting.

#### 4.2.2 Standard Mounting

The sensors protrude beyond the metal holder.



#### Sensors with a thread

- ➡ Insert the sensor through the hole in the sensor holder.
  - ➡ Screw the sensor tight.
  - ➡ Turn the mounting nuts on both sides on the thread protruding from the holder.
  - ➡ Tighten the mounting nuts carefully to avoid damage, particularly to smaller sensors.
- i** Prefer the standard mounting of the sensor, because the optimum measurement results can be achieved with this method!

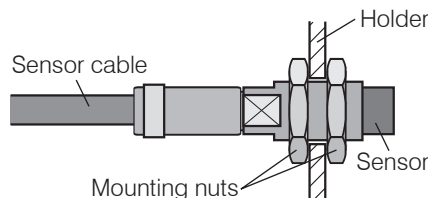


Fig. 11 Unscreened sensor with thread in standard mounting

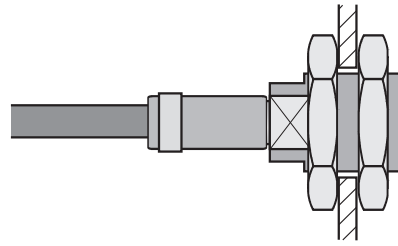


Fig. 12 Screened sensor with thread in standard mounting

**i** During calibration maintain the same relative position of the sensor to the holder as for the measurement.

**Sensors without a metallic housing**

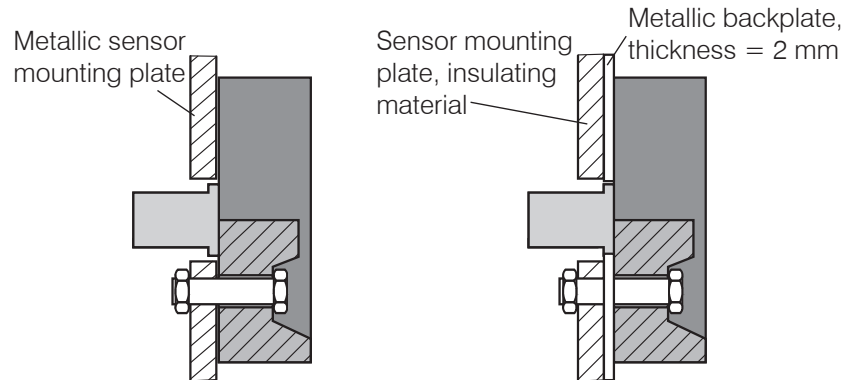
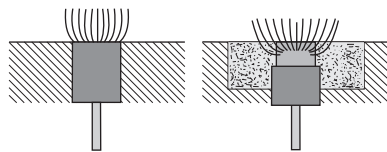


Fig. 13 Sensor without a metallic housing in standard mounting.

Diameter of the metallic sensor mounting plate respectively metallic backplate:  
 Sensor dia.  $\leq$  DIA  $\leq$  3 x sensor dia. or more. Optimum: Diameter of the sensor holding plate = 1.3 x sensor diameter.

- Fix the sensor using the threaded pins on the metal sensor mounting plate or fix the sensor using the threaded pins and metallic backplate (included in the delivery) on the sensor mounting plate.
- Carefully tighten the mounting nuts on the threaded pins to avoid damage to the sensor.

**4.2.3 Flush Mounting**



**Sensors with a thread**

- Mount screened or unscreened sensors flush in a sensor holder of insulating material (plastic, ceramic, et cetera).
- Mount the screened sensors flush in a metal sensor holder.
- Mount the unscreened sensors flush in a metal sensor holder. Make sure that a recess of a size three times the sensor diameter is used, see Fig. 15.
- In all mounting cases screw the sensor into the threaded hole and lock it with the mounting nut.
- Tighten carefully to avoid damage, particularly to smaller sensors.

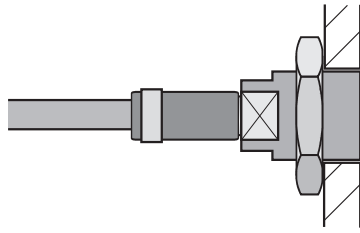


Fig. 14 Flush mounting of a screened sensor in a metal holder.

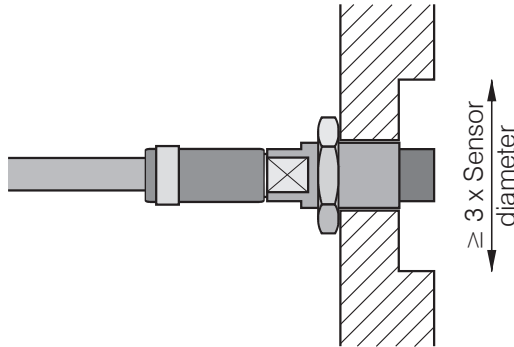


Fig. 15 Flush mounting of an unshielded sensor in a metal holder.

- Calibrate the measurement system in the measurement arrangement with the original mounted sensor!

#### 4.2.4 Measuring Object Size

The relative size of the measuring object to the sensor has effects on the linearity deviation for eddy current sensors. Ideally, the measuring object size

- for shielded sensors is at least 1.5 times the sensor diameter,
- for unshielded sensors at least 3 times the sensor diameter.

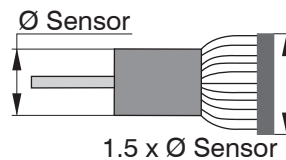


Fig. 16 Minimum object size for shielded sensors, type ES

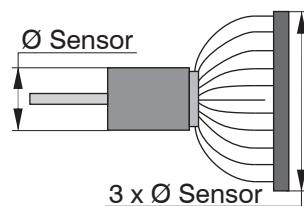


Fig. 17 Minimum object size for unshielded sensors, type EU

If the required object minimum size can not be complied with, the following aspects must be taken into account for a sufficiently high linearity:

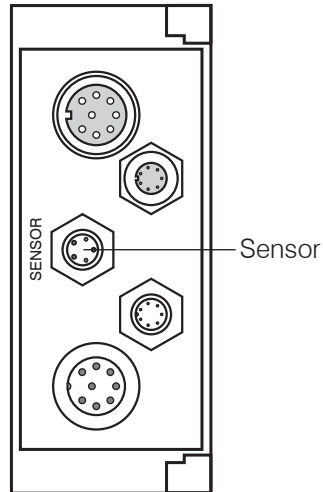
- The size of the measuring object must not change.
- The measuring object must not be moved laterally to the sensor face.

A successful standard calibration is a prerequisite to minimise linearity errors, see Chap. 5.4.1. A linearity calibration on the corresponding measuring object must be performed without fail. A change of the measuring object size has significant effects on the measurement results.



### 4.3 Sensor Cable

- ➡ Do not kink the cable - the minimum bending radius is 39 mm.
- ➡ Lay the cable such that no sharp-edged or heavy objects can affect the cable sheath.
- ➡ Make the connection between the sensor and controller using the sensor cable (type EC...).
- ➡ Connect the sensor cable to the backside of the controller, see [Fig. 18](#).
- ➡ Check the plugged connections for firm seating.



*Fig. 18 Rear view of the controller with sensor plug connection.*

**i** In pressurized areas protect the cable from pressurization!

### 4.4 Controller

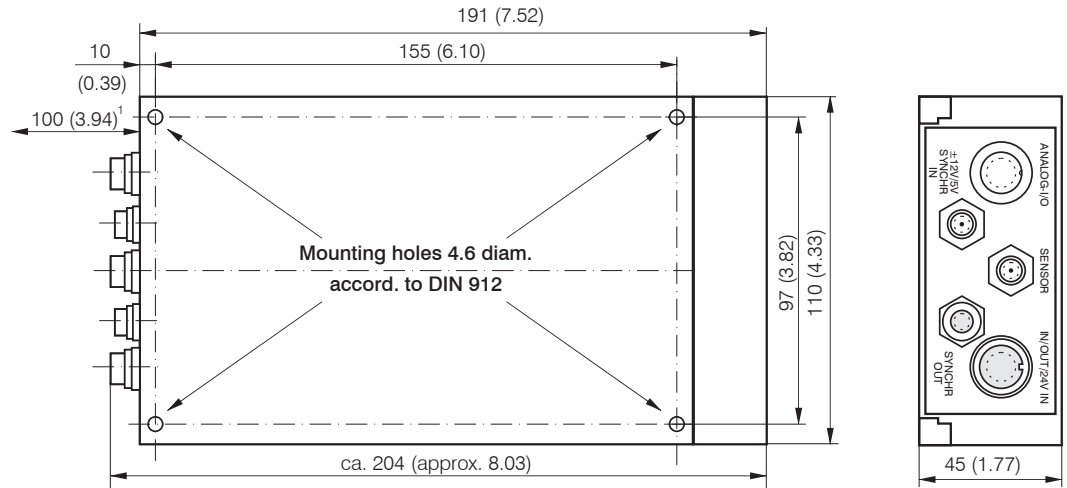


Fig. 19 Dimensions and mounting method for controller.

Legend: mm (inches)

➡ Mount the controller with M4 screws (accord. to DIN 912).

### 4.5 Connecting the Measurement System

#### 4.5.1 eddyNCDT3300

Provide the power supply for the controller.

- ➡ Connect the connecting cable PWC2/4 (DT3300) available as an accessory or a cable made up by the user
    - to the 7-pole male connector ( $\pm 12$  V/5V Synchr IN, see Fig. 20) on the controller.
    - to a power supply  $\pm 12$  VDC / 5 VDC.
  - ➡ Connect the measurement signal displays and recording devices to the controller.
  - ➡ Connect the connecting cable SCA3/5 or SCD3/8 (both available as accessory) or a cable made up by the user
    - to the 8-pole male connector (Analog I/O, see Fig. 20) on the controller.
    - to measurement signal displays or recording devices.
- The power supply PS300/12/5 is available as an accessory.  
 1 A PS300/12/5 can supply four eddyNCDT3300 as a maximum.

1) Free space for connectors and cables

Fig. 20 Measurement setup and synchronization of another controller DT3300.

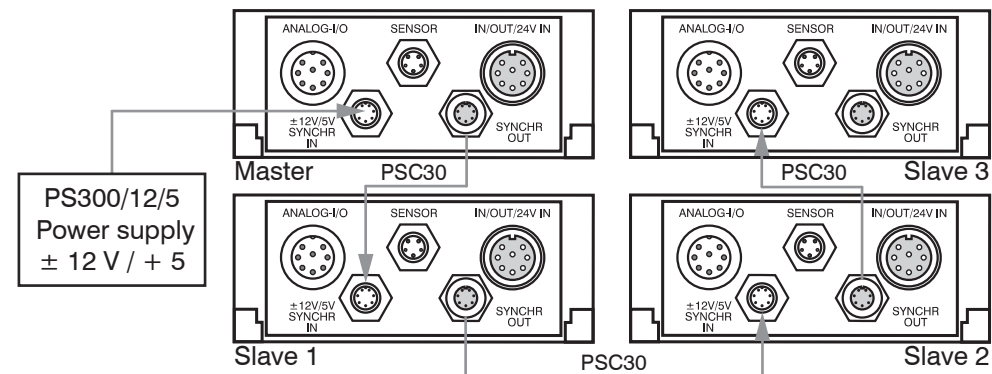


Fig. 21 Measurement setup and synchronization for up to 4 controllers DT3300

- For the synchronization from a 5<sup>th</sup> controller the application of a synchronization divider MCS303 is required.

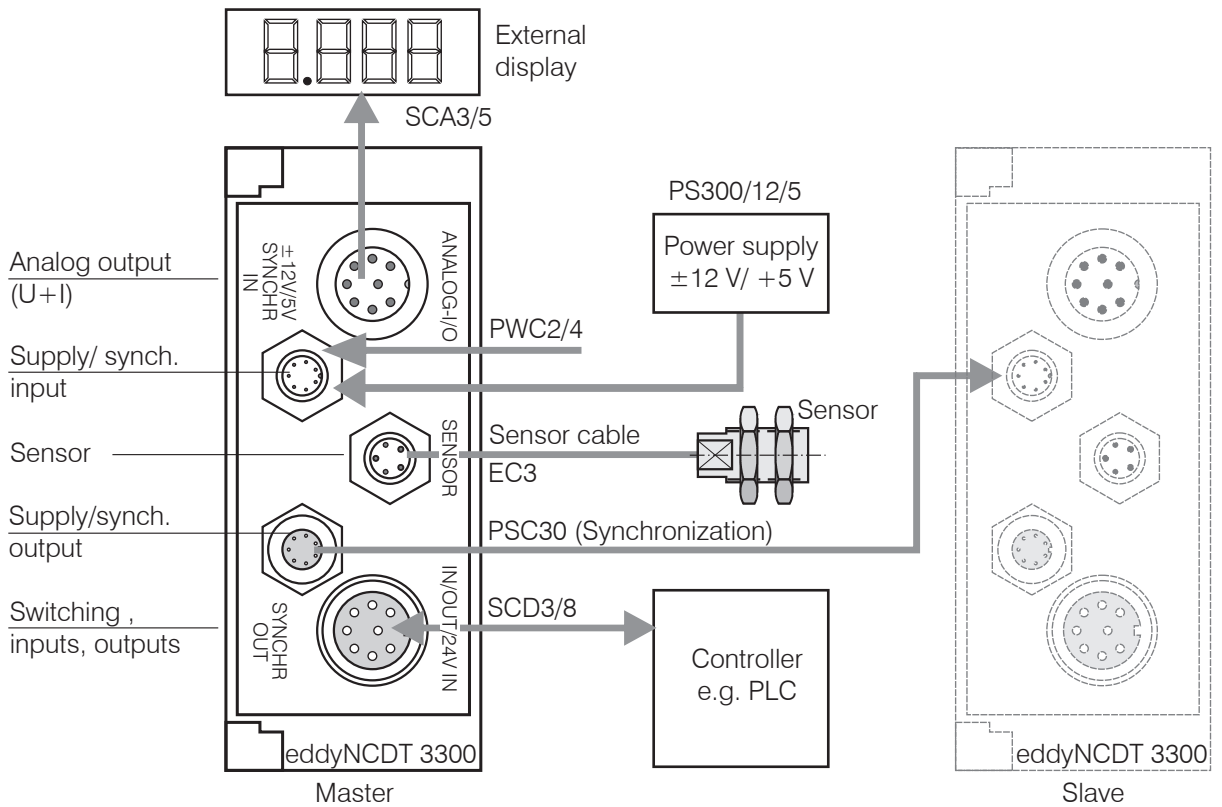


Fig. 22 Measurement setup and synchronization of another DT3300 controller

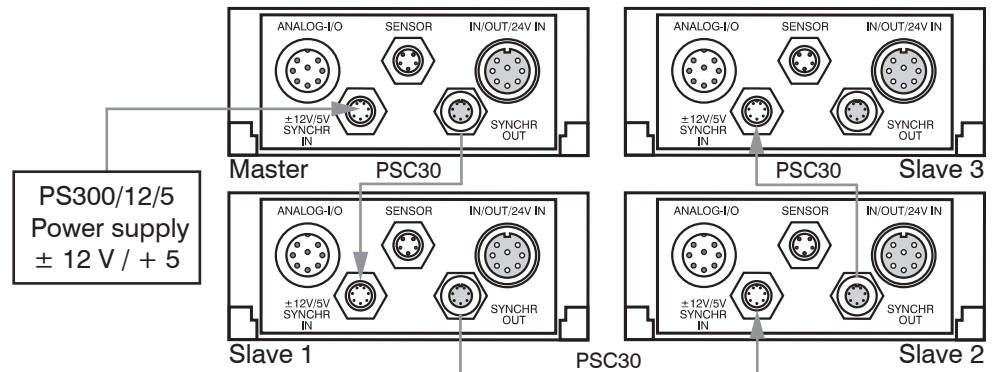
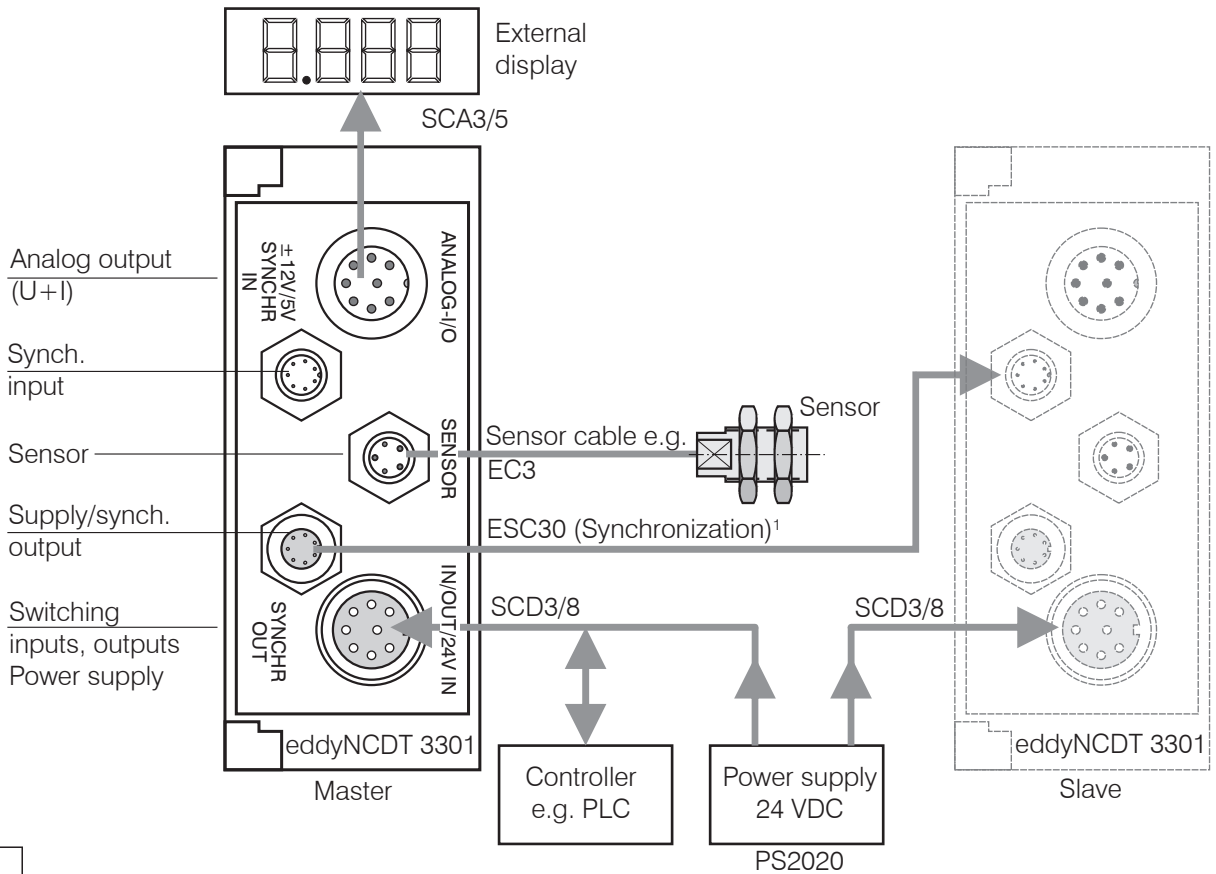


Fig. 23 Measurement setup and synchronization for up to 4 DT3300 controllers

#### 4.5.2 eddyNCDT3301

Provide the power supply for the controller.

- Connect the connecting cable SCD3/8 available as an accessory, or a cable made up by the user
  - to the 8-pole female connector ( $\pm 12\text{ V}/5\text{ V}$  Synchr IN, see Fig. 24) on the controller.
  - to a power supply + 24 VDC.
- Connect the measurement signal displays and recording devices to the controller.
- Connect the connecting cable SCA 3/5 or SCD 3/8 (both available as accessory) or a cable made up by the user
  - to the 8-pole male connector (Analog I/O, see Fig. 24) respectively to the 8-pole female connector (IN/OUT/24 V IN, see Fig. 24) on the controller.
  - to measurement signal displays or recording devices.



**NOTICE**

Do not use the PSC30 for synchronization. Damage of the second controller (slave). Use the ESC30 synchronization cable.

Fig. 24 Measurement setup and synchronization of another controller DT3301.

**i** Single-channel power supply PS2020 is available as an accessory. A PS2020 can supply four eddyNCDT3301 as a maximum.

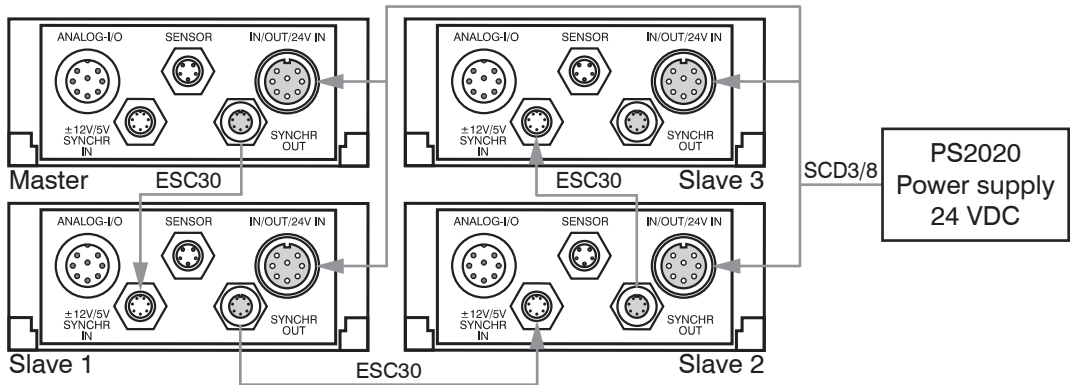


Fig. 25 Measurement setup and synchronization for up to 4 controllers DT3301

**i** For the synchronization from a 5<sup>th</sup> controller the application of a synchronization divider MCS303 is required.

### 4.6 Adaptation Board

If the sensor is replaced by a different type, the sensor cable length exchanged or the measurement object material (ferromagnetic/non-ferromagnetic) changed:

- Change the adaptation board.
- Check the calibration and relinearize the measurement channel, if necessary, see Chap. 5.4

**i** If sensor and/or adaptation board have been changed, the factory calibration is wrong. Work with the characteristics 1 up to 3, see Chap. 5.1.1.

Proceed when exchanging the adaptation board in the following way:

- Switch-off the controller.
- Open the controller, see Fig. 26.

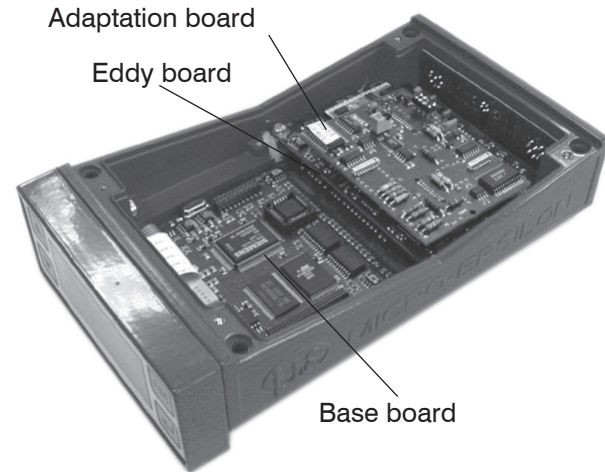


Fig. 26 Interior view of the eddyNCDT330x single-channel displacement measurement system with adaptation board, Eddy board and Base board

- Loose the four screws, with these the adaptation board is fixed.
- Pull-out the adaptation board vertically to the top.
- Remove the new adaptation board from the packaging.
- Plug the new adaptation board on the base board vertically.
- Save the adaptation board with the four screws.
- Screw the controller cover.
- Switch-on the controller.

The controller identifies the exchange of the adaptation board and gets in touch with succeeding display message after switching-on.

```
New board detected!  
Data are copied from the  
new EA3000 board.  
Please check settings  
(Limits / output / display)
```

- Confirm the dialog.
- Press the key `←|` as well.

	<b>Adaption board</b>	<b>Eddy board</b>	<b>Base board</b>
Display contrast, password, language			x
Display layout			x
Low-pass filter analog output			x
Limit characteristic, logic, times			x
Calibration data	x		
Characteristics (1 ... 4)			x
Start of measuring range, measuring range	x	x	x
Measurement object	x	x	x
Board serial numbers	x	x	x
Sensor data	x		
Sensor options	x	x	
Sensor serial number	x	x	x
Sensor type	x	x	x

*Fig. 27 Controller parameter and related location*

## 5. Operation

➡ Check the measurement system setup:

- Is the controller matched for the application (measurement object material of the adaptation board)?
- Are the sensor, sensor cable length and controller matched? (Type and serial number).
- Is the sensor connected?
- Are the cable connections secure?

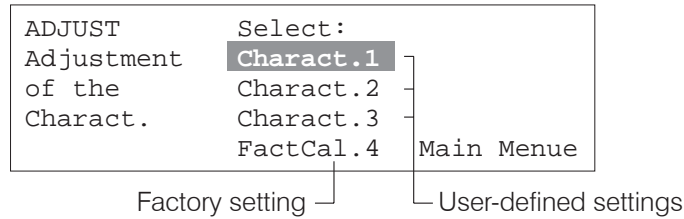
### 5.1 Basic Settings

#### 5.1.1 Characteristic

All settings (Calibration, Output, Limits, et cetera) are combined in one set of characteristics. User-defined settings can be saved in Characteristic 1 to Characteristic 3 (Charact.1 ...Charact.3).

The characteristic "FactCal.4" contains a factory setting for the system and, apart from the point calibration, can be changed. MICRO-EPSILON recommends that the factory setting is not changed.

More details on standard setting, see Chap. A 5.



#### 5.1.2 Language, Display Layout and Contrast

##### Language selection

The selection of the language in which the eddyNCDT 330x is operated and in which all messages are displayed, occurs as follows:

➡ Change in the main menu

MAIN	StartMeas	Adjustment
MENU	Start Ch1	SystCONSTR
eddyNCDT	Start Ch2	Addresses
DT3300	Start Ch3	GenerINFO
Micro-Eps.	StartFCh4	InfoSTART

➡ Call the submenu InfoSTART and select the language.

STARTe	Contrast:	Set to
ENGLISH	10	Standard
Select	MountPos	Adjustment
Language:	of Casing	lung
deutsch	CrossPos	Main Menu

The eddyNCDT 330x stores the set language and also uses the stored language when it is switched on again.

### Display layout

To achieve the optimum representation on the LC graphical display, the display must be matched to the controller orientation. As shipped, the orientation is set to "CrossPos".




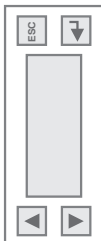
Controller orientation	Display setting
	Horizontally ("CrossPos")
	Vertically ("On edge")
	Horizontally 180 ("Cross180")
	19 inch ("19-inch")

Fig. 28 Possible mounting orientations of the controller with associated display setting.

➡ Call the submenu InfoSTART > MountPos and select the mounting orientation.

STARTe	Contrast:	Set to
ENGLISH	10	Standard
Select	MountPos	Adjustment
Language:	of Casing	
deutsch	<b>CrossPos</b>	Main Menu

### Display contrast

You can adapt the display contrast to the local lighting conditions.

➡ Call the submenu InfoSTART and set the contrast of the display.

START	MountPos	Select
	of Casing	
	CrossPos	
	Contrast:	
	<b>84</b>	Main Menu



### 5.1.3 Password

The use of a password prevents unauthorized data inputs. As shipped, password protection is not activated. Exception: Standard settings (Standard)

Password protection is possible for

- Zero setting via key combination.
- Low-pass filter and output.
- Limits.
- Characteristic (Charact.1-4, Calibration, Output, Measurement data, Display).
- Standard
- Calibration

Password protection parameters

“+“ Change possible for the user

“-“ Change not possible (only for adjuster/administrator)

The settings for the password protection apply in parallel for all four characteristics, see Chap. 5.1.1. Password protection for the orientation and language is not possible.

PASSW	ForOperat	+ZeroSetg
PASSWORD	+ = free	+LimSwitch
Old: 0	-Locking	+Output
New: 0	+Charact.	-Standard
	+Calibrat.	Charact

Fig. 29 The password menu

As shipped, the controller has the password “8122“. Use this password if you have forgotten your own password.

Password parameters

- Word size: 4 characters
- Permitted symbols: “0“, “1“, “2“, ... “9“, “-“ and space symbol.

Entering a new password occurs as follows:

- ➡ Type in the password as shipped on the position “Old“.
- ➡ Select the menu item “New“ and type in your personnel four digit password.

The definition or change to a password occurs in the menu Adjustment >Characteristic > Password. The old password must be entered to issue a new password or password protection.

**Procedure:**

Key(s)	Effect	Display
---	---	0
↵	Menu point selection	0
▲ or ▼	Choose position in word	0
↵	Position released for editing	0
▲ or ▼	Edit position	1
↵	Confirm position	1
↵	Return	
↵	Confirm word	1

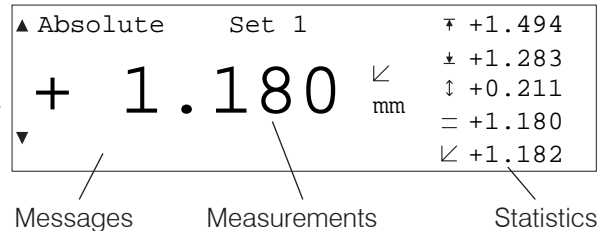
### 5.1.4 Display Selection

➡ Change to the main menu and select the characteristic (for example Start Ch1) for which the display is to be valid.

MAIN	StartMeas	Adjustment
MENU	<b>Start Ch1</b>	SystCONSTR
eddyNCDT	Start Ch2	Addresses
DT3300	Start Ch3	GenerINFO
Micro-Eps.	StartFCh4	InfoSTART

START1	1.180	<b>StndrdDisp</b>
Set 1	Absol/Rel	MaxDisplay
EU2	1.180	Bargraph.D
Alu	ZeroSettg	Diagram
0... 10V	Absolute	MainMenu

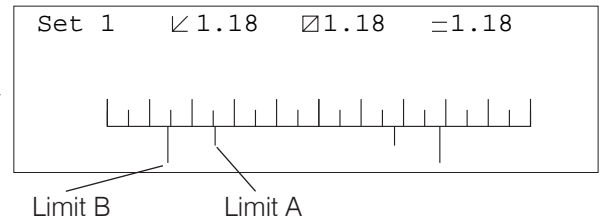
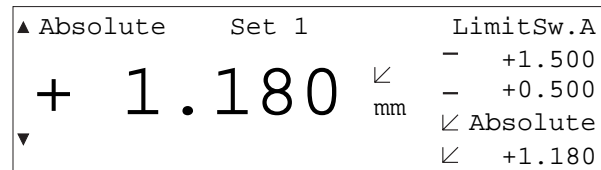
#### Standard Display (StndrdDisp.)



#### Functions in the standard display

- ▲ Scroll measurements (abs., rel., min., max. ...)
- ▼ Scroll messages
- ↶ Scroll statistics (statistics and limit switches)

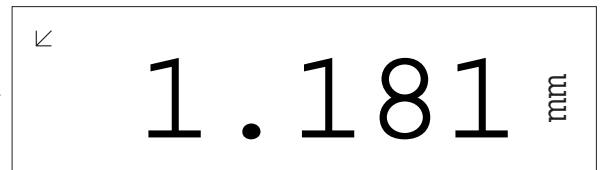
#### Bar display (Bargraph.D)



#### Functions in the display Measurement and unit

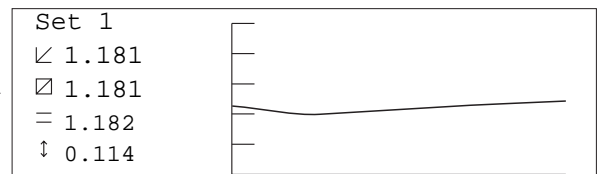
- ▼    ▲ Scroll measurements

#### Measurement and unit (MaxDisplay)



Casual a deviation between the display value and the measured value on the analog output is possible due to different accuracy classes of the used measurement device.

#### Diagram



#### Symbols

- ↘ Measurement, absolute
- ↗ Measurement, relative
- = Average
- ↘ Dynamic deviation
- ↕ Peak to Peak value
- ↕ Maximum
- ↓ Minimum
- ↕▲ Scroll display
- Upper limit value
- Lower limit value

The statistic values are calculated from the measurements inside the evaluation cycle, (“CyclTime“), see Fig. 44. The settings for the evaluation cycle occur in the menu Adjustment > Characteristic > Display.

### 5.2 Analog Output

The settings for the analog output, see Fig. 55 (for the pin assignment), occur in the menu Adjustment > Characteristic > Output. Administrator status is needed for changes to the output configuration, if the output is given password protection, see Chap. 5.1.3. The controller is equipped with a current output of 4 mA (SMR) to 20 mA (EMR).

OUTP. 1	Output	LP Filter
ADJUSTMENT	Voltage:	2500 Hz
Set 1	0...10 V	
EU1		
Aluminium		Charact.

The voltage output is selectable. Variants [SMR/EMR]: 0/10 | 5/0 | 0/5 | 10/-10 | -10/ 10 | 0/-10 | -10/0 | 5/-5 | -5/5 | 0/-5 | -5/0 | 2.5/-2.5 | -2.5/2.5 | 10/0.

SMR = Start of measuring range      EMR = End of measuring range

The second order low-pass filter cut-off frequency (LP filter) is selectable. Variants: 25 Hz | 2500 Hz | 25 kHz | 100 kHz; factory setting: 25 kHz.

### 5.3 Scaling Measured Values Display

The settings for the display representation of the measurements occurs in the menu Adjustment > Characteristic > Calibration (Calibrat.). Administrator status is needed for changes to the display, if the display is given password protection, see Chap. 5.1.3.

RANGE1	Display	Unit
Set 1	Startp. MR	mm
ES2	0.0000	
S/N 1035	ENDMRRange	Man.Calib.
SN=SerialN	2.000	Calibrat.

The measurement unit is selectable. Variants: mm | n.d. (undefined) | mil | inch |  $\mu\text{m}$  (um).

- If you change the display unit, the display values “Startp. MR“ and “EndMRRange“ have be edited new.

#### Moving the characteristic

The base characteristic, see Fig. 30, is defined by the zero point and the slope. The measurements can be scaled as required. To do this, specify a starting value “Startp. MR“ and an end value “EndMRRange“. The characteristic is then defined by the points “Startp. MR“ (1) and “EndMRRange“ (2).

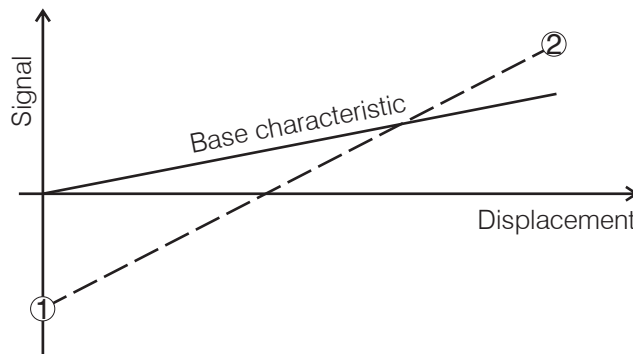


Fig. 30 Moving the characteristic

## 5.4 Calibration

Measurement systems in the eddyNCDT Series are shipped with a factory calibration. If the sensor or the measurement object (material, geometry) is changed by the user, a calibration must be carried out before the measurement. Here, use the following if possible:

- the original sensor mounting and
- the original measurement object.

### 5.4.1 Standard Calibration

Balancing occurs via three distance points which are specified by a comparison standard.

- If the original measurement object cannot be used, simulate the measurement environment as closely as possible.

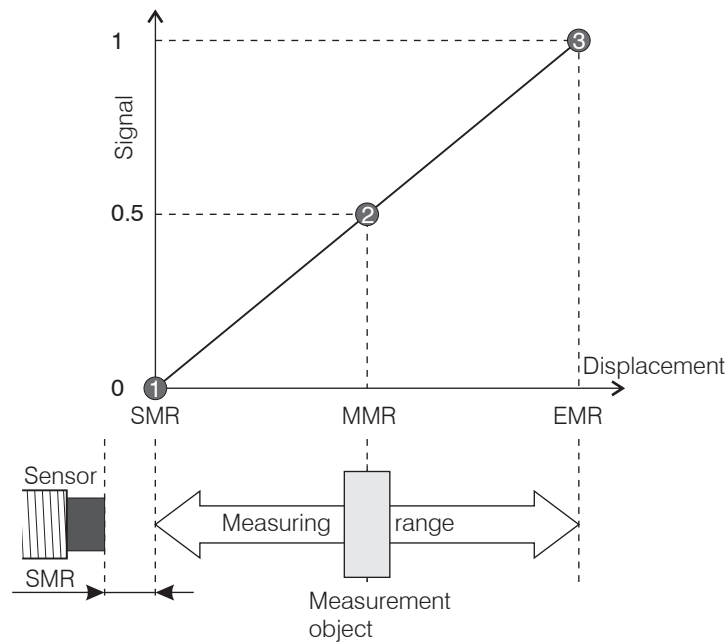


Fig. 31 eddyNCDT systems can be individually linearized and calibrated by a three-point balance.

Three reference points:

- SMR, Start of measuring range (1)
- MMR, Midrange (2)
- EMR, End of measuring range (3)

Calibration aids:

- Special micrometer calibration device with non-rotating micrometer spindle, see Fig. 32 (available as an accessory), or
- Distance washers in insulating material (easy to handle).

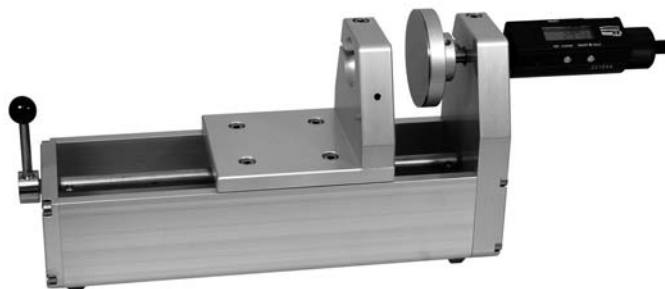


Fig. 32 Micrometer calibration device

Each measurement channel is tested before shipping. The acceptance log with data of temperature stability and a graph of the linearity is also supplied.

**Procedure:**

• The measurement equipment should warm up for about 30 minutes before a measurement or calibration is carried out.

➔ Place the measurement object at the base distance from the sensor.

The start of measuring range is assigned to the sensor type, see Chap. 4.2.1.

Position of the measurement object: -5 % to +10 % FSO from the start of the measurement range.

FSO = Full Scale Output

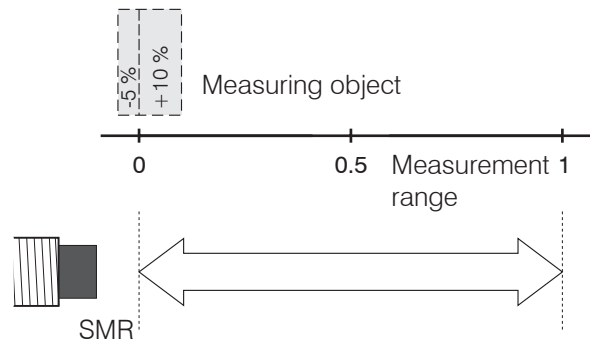


Fig. 33 Positional tolerance of the measurement object at the start of the measurement range.

➔ Call the submenu Calibration. The submenu is located in the menu Adjustment > Characteristic (Charact.) > Calibration (Calibrat.).

Administrator status is needed if the calibration is given password protection, see Chap. 5.1.3.

➔ If you accept the settings for the scaling of the measured values, see Chap. 5.3, press the key ▼ to choose “Calibrat” (calibration) and press the key ↵.

CALIB2	ES2	Set 1
3xADJinPOS	Input Pos	Enter Key
StartpntMR	0.000	Calibrtd
MidM.Range	1.000	Calibrtd
EndM.Range	2.000	Calibrtd

Factory setting for the measurement object position. The values must be matched to the actual position of the measurement object if the figure for the factory setting cannot be met.

Fig. 34 The calibration menu

➔ Press the key ↵ to edit the value for the start of the measurement range (MeasRStart) due to the positional tolerance, see Fig. 33.

➔ Press the key ▼ to accept the factory setting for the start of the measurement range (StartpntMR). The system then skips in the menu to the point “Calibrtd”

CALIB2	ES2	Set 1
3xADJinPOS	Input Pos	Enter Key
StartpntMR	0.000	Calibrtd
MidM.Range	1.000	Calibrtd
EndM.Range	2.000	Calibrtd

The system expects confirmation of the start value.

➔ Press the key ↵. The system accepts the current sensor value as the start value for the calibration.

CALIB2	ES2	Set 1
3xADJinPOS	Input Pos	Enter Key
StartpntMR	0.000	Accepted
MidM.Range	1.000	Calibrtd
EndM.Range	2.000	Calibrtd

The system confirms acceptance of the start value.

- ➡ Press the key ▼. The system skips in the menu to the point “MidM.Range”.
- ➡ Set the measurement object to the center of the measurement range. Position of the measurement object: ±10 % FSO from the center of the measurement range.

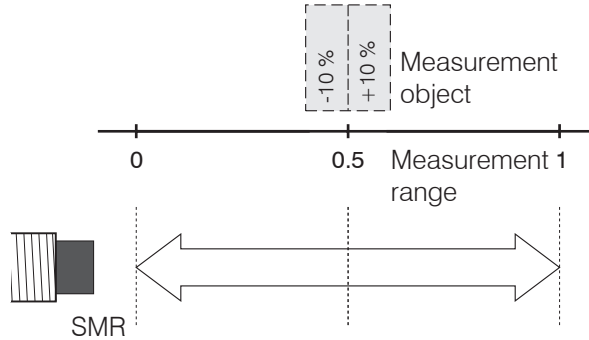


Fig. 35 Positional tolerance of the measurement object in the center of the measurement range.

- ➡ Press the key ↵ to edit the value for the center of the measurement range (MidM.Range) due to the positional tolerance, see Fig. 35.
- ➡ Press the key ▼ to accept the factory setting for the center of the measurement range (MidM.Range). The system then skips in the menu to the point “Waiting”
- ➡ Press the key ↵. The system accepts the current sensor value as the second value for the calibration.
- ➡ Press the key ▼. The system skips in the menu to the point “EndM.Range”.
- ➡ Set the measurement object to the end of the measurement range. Position of the measurement object: -10 % to +5 % FSO from the end of the measurement range.

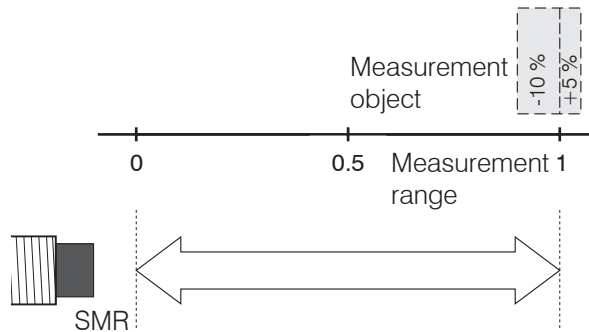


Fig. 36 Positional tolerance of the measurement object at the end of the measurement range.

- ➡ Press the key ↵ to edit the value for the end of the measurement range (EndM.Range) due to the positional tolerance, see Fig. 36.
- ➡ Press the key ▼ to accept the factory setting for the end of the measurement range (EndM.Range). The system then skips in the menu to the point “Waiting.”
- ➡ Press the key ↵. The system accepts the current sensor value as the third value for the calibration.
- ➡ Press the key ESC. The system executes the linearization.



The system reports that calibration has finished. The system returns to the menu Adjustment > Characteristic after calibration has finished.

### 5.4.2 Manual Calibration

Balancing occurs via two distance points. Use this calibration only for measurements if

- Start of measuring range (SMR), midrange (MMR) and end of measuring range (EMR) can not be reached exactly or
- the linearity of the system plays a secondary role (for example stroke measurements).

**i** With a two-point calibration the specified technical data can not be guaranteed!

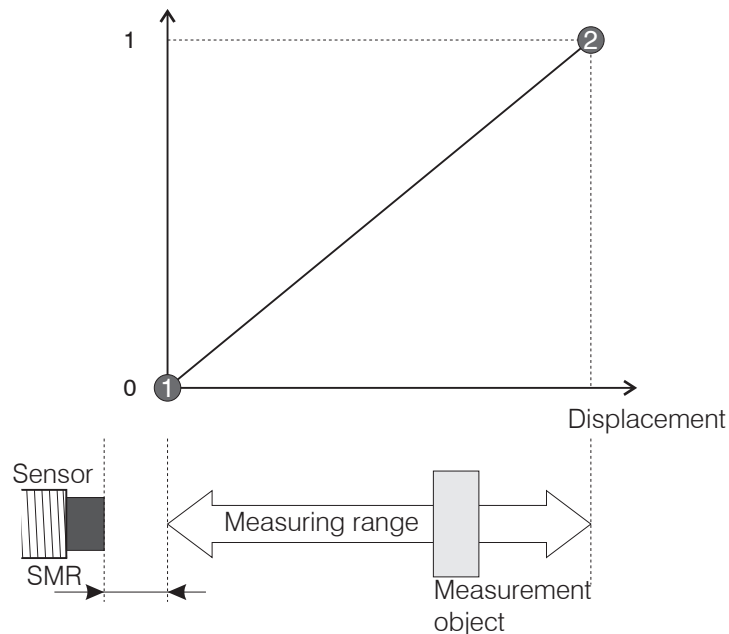


Fig. 37 eddyNCDT systems can be individually linearized by a two-point balance.

Two reference points:

- SMR, Start of measuring range (1)
- EMR, End of measuring range (2)

**Procedure:**

**i** The measurement equipment should warm up for about 30 minutes before a measurement or calibration is carried out.

➡ Place the measurement object at the base distance from the sensor.

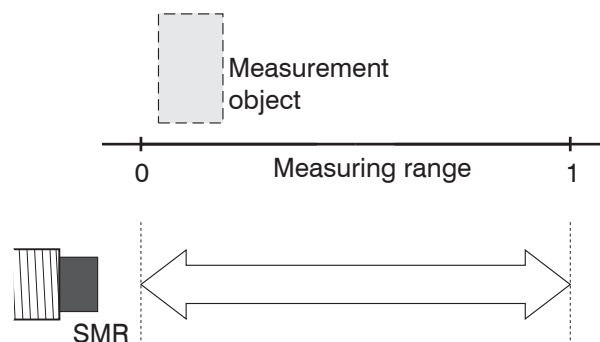


Fig. 38 Position of the measurement object at the start of the measurement range

➡ Call the submenu Calibration. It is located in the menu Adjustment > Characteristic Charact.) > Calibration (Calibrat.).

Administrator status is needed if the calibration is given password protection, see Chap. 5.1.3.

➡ Choose the point "Man.Calib." (Two-point calibration) with the key ▼ and press the key ↵.

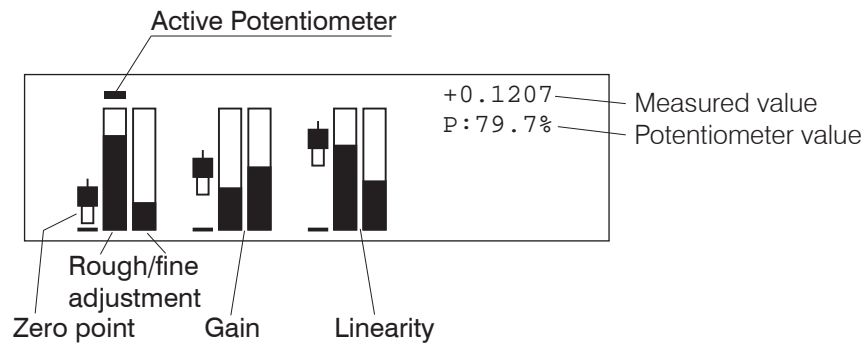


Fig. 39 Screen for the manual calibration with the potentiometers zero, gain and linearity.

**i** Dual potentiometer (rough and fine adjustment) for linearization.

➡ Select the zero point potentiometer with the key ▲ or ▼.

Procedure for potentiometer setting:

Key(s)	Effect	Display
---	---	■
←↵	Position released for editing	■
▲ or ▼	Edit position	■
←↵ Confirm value		■

➡ Adjust the zero point with the potentiometers for rough and fine adjustment.

➡ Set the measurement object to the end of the measurement range.

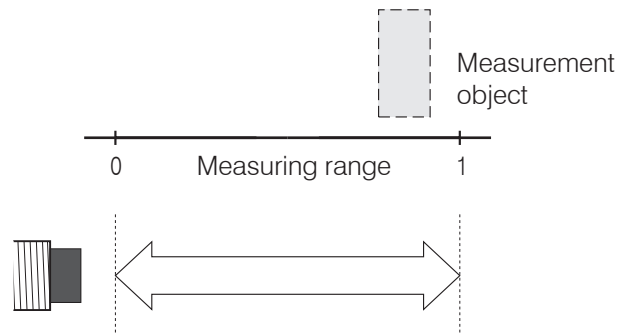


Fig. 40 Position of the measurement object at the end of the measurement range

➡ Select the gain potentiometer with the key ▲.

➡ Adjust the gain with the potentiometers for rough and fine adjustment.

➡ Press the key ESC and then the key ←↵ to store the adjustments for the manual calibration.



### 5.5 Relative and Absolute Measurements

The eddyNCDT 330x can execute relative measurements. The relative measurement is triggered by:

- key combination,
- pulse on the digital I/O,
- command "ZeroSettg" in the menu Characteristic (Start Ch1 ... Start Ch3).

The relative measurement is terminated by a system restart.

The reference value of a relative measurement for the display is set to the start value of the display ("Startp. MR", see Chap. 5.3). The reference value be freely selected between the start and end values ("Startp. MR" and "EndMRRange") of the display.

➡ Call the submenu ZeroSettg. It is located in the menu Adjustment > Characteristic > ZeroSettg.

ZeroS1	ZeroSett:	Current
ADJUSTM.	Enter Key	Output
Set 1	+Down Key	not affect
SET to VAL	Abs:Enter	byZeroSett
0.000	+ Up Key	Charact.

Fig. 41 System setting for the reference value of the relative measurement.

- Relative measurements can only be viewed on the display or the voltage output.
- ! The current output has an output of 4 mA (SMR) up to 20 mA independent from relative measurements.

➡ Press the key ←| to edit the reference value of the relative measurement.

#### Voltage output

Start of measuring range	End of measuring range	Reference value
0 V	10 V	0 V
10 V	0 V	10 V
5 V	0 V	5 V
0 V	5 V	0 V
10 V	-10 V	0 V
-10 V	10 V	0 V
0 V	-10 V	0 V
-10 V	0 V	-10 V
5 V	-5 V	0 V
-5 V	5 V	0 V
0 V	- 5 V	0 V
-5 V	0 V	-5 V
2,5 V	-2,5 V	0 V
-2,5 V	2,5 V	0 V

Fig. 42 Reference values of a relative measurement for the voltage output, see Chap. 5.2

You can watch a relative measurement in the displays

- Standard Display (StndrdDisp),
- Bar display (Bargraph.D),
- Measurement and unit (MaxDisplay),
- Diagram or
- Submenu Start Characteristic (Start Ch1)

- The symbol ☐ before a measured value shows that it is a relative measurement.

### 5.5.1 Relative Measurements with Key Combination

Administrator status is needed to set the zero with a key combination if zero setting is protected with a password, see Chap. 5.1.3.

Start of a relative measurement:

➡ Press the keys  $\leftarrow$  and  $\blacktriangledown$  synchronous

End of a relative measurement:

➡ Press the keys  $\leftarrow$  and  $\blacktriangle$  synchronous.

### 5.5.2 Relative Measurements with Hardware Interrupt

The relative measurement is triggered by a pulse on Pin 1 of the 8-pole DIN socket of the digital I/O, see Fig. 54, see Fig. 56. The input reacts to rising edges of the pulse.

Nominal voltage for an external pulse is 24 VDC.

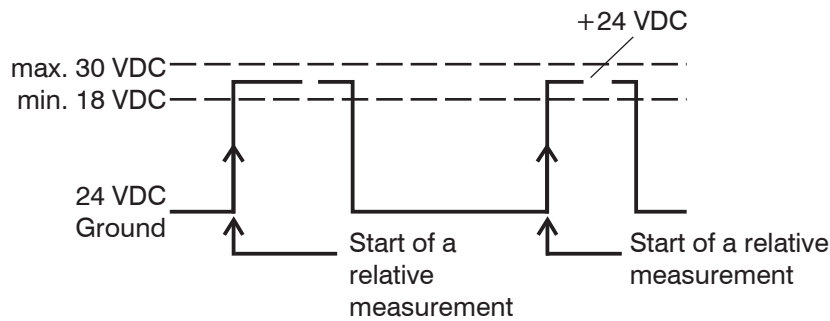
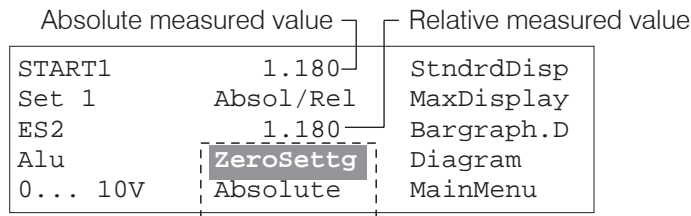


Fig. 43 Levels for relative measurement with external hardware pulse

### 5.5.3 Relative Measurements with the Command “ZeroSettg”

➡ Call the submenu characteristics (“Start Ch1“ ... “Start Ch3“, “StartFCh4“).

It is located in the main menu.



➡ Choose with the keys  $\blacktriangle$  or  $\blacktriangledown$  “ZeroSettg“. Press the key  $\leftarrow$  to start the relative measurement.

➡ Choose with the keys  $\blacktriangle$  or  $\blacktriangledown$  “Absolute“. Press the key  $\leftarrow$  to stop the relative measurement and to return to absolute measurement.

### 5.6 Maximum, Minimum, Average and Peak-value

The eddyNCDT 330x logs peak values. The statistic values are calculated from the measurements inside the evaluation cycle ("CyclTime"), see Fig. 44 for more information. Updating of the measured values inside the evaluation cycle occurs at intervals of 1/10<sup>th</sup> of the evaluation cycle.

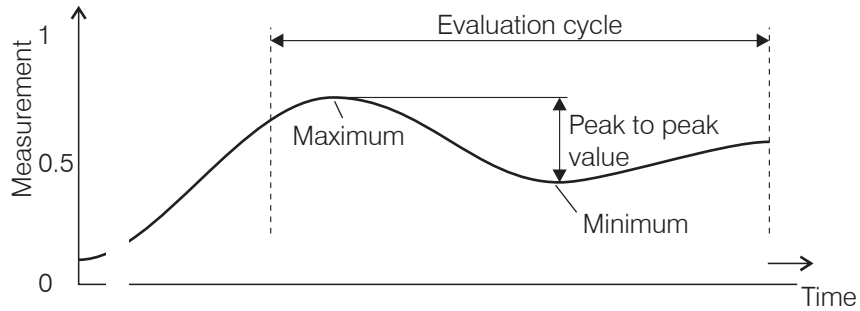


Fig. 44 Statistic values and the evaluation cycle

The settings for the evaluation cycle are made in the menu Adjustment > Characteristic > Display.

DISPL1	CyclTime	Refresh
Display:	10 sec	0 msec
Absolute		Hold by
		Reset IN
		Charact.

The cycle time (CyclTime) for the display is selectable.

Updating occurs at intervals of 1/10<sup>th</sup> of these figures. The factory setting for the display evaluation cycle is 100 ms.

**i** The times for the display evaluation cycle and the limit evaluation cycle are independent.

Micro-Epsilon recommends a refresh time of 1 ms.

The values for an absolute maximum/minimum are deleted and logged anew with the start of a relative measurement.

You can watch maximum, minimum, average and peak values in the displays

- Standard Display (StndrdDisp),
- Measurement and unit (MaxDisplay) or
- Diagram (only peak to peak values).

- i**
- ↑ Relative maximum
  - ↕ Peak to peak values
  - ↓ Relative minimum
  - = Average

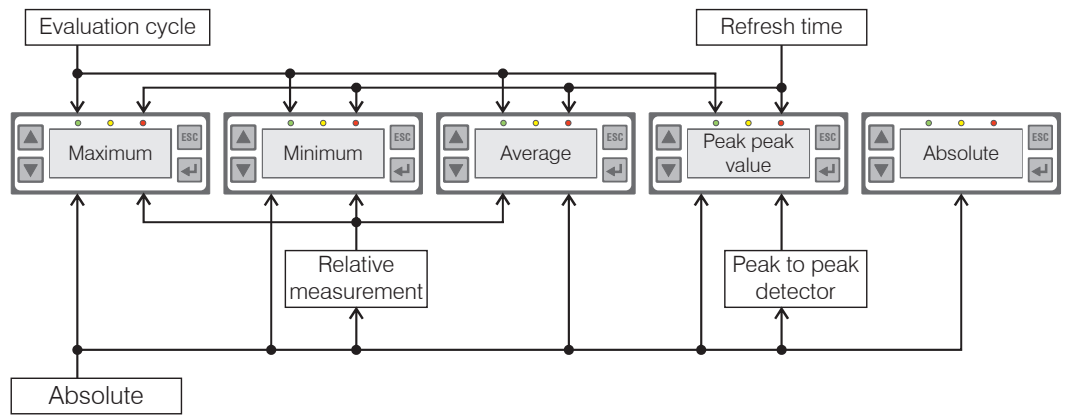


Fig. 45 Display values and the relating calculation

### 5.7 Limit Monitoring

The eddyNCDT 330x can check the measurement result to adjustable limits. This means that threshold values can be monitored, impermissible tolerances detected and sorting criteria realized.

The reference for the limit monitoring is selectable and applies to the current characteristic. Variants: Absolute | Peak value ("PkPkValue") | Relative | Dynamic Deviation ("Dynam.Dev")

**Functions:** Overrange ("HighExced"), underrange ("LowExceed"), window.

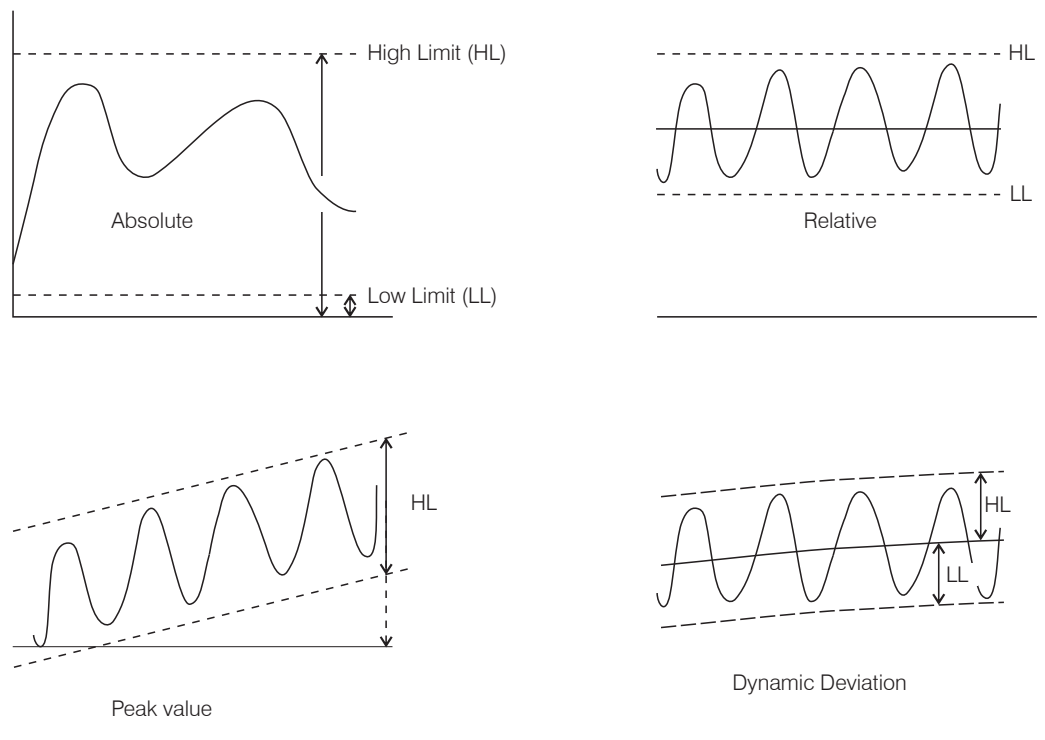


Fig. 46 References for the limit monitoring.

With the reference "Peak value" ("PkPkValue") monitoring can only occur for overrange (limit band) and only the high limit can be set.

With the reference "Peak value" ("PkPkValue") or "Dynamic Deviation" ("Dynam.Dev") the evaluation cycle ("CycleTime") must be set.

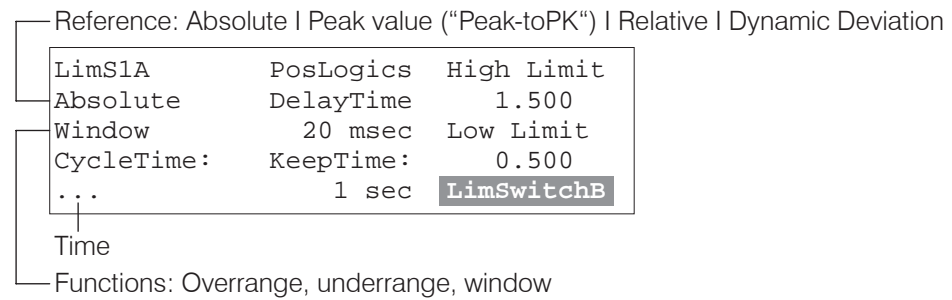


Fig. 47 The menu limit ("LimSwith") (Adjustment > Charact.x > LimSwithA)

The limit evaluation cycle (CycleTime) is used for the references peak value ("PeaktoPk") and dynamic deviation. The setting for the limit evaluation cycle is made in the menu Adjustment > Characteristic > LimSwithx. The cycle time (CyclTime) for the limit switch is selectable.

Variants: 100/200/500 msec.  
1/2/5/10/20/50/100 sec.

Updating occurs at intervals of 1/10<sup>th</sup> of these figures. The factory setting for the limit evaluation cycle is 1 s.

- Set the times for the limit evaluation cycle and the display evaluation cycle independently of each other.

**Factory setting**

Limit switch A: High limit at 75 % FSO.  
Low limit at 25 % FSO.

Limit switch B: Measurement range limits (window)  
High limit to EMR  
Low limit to SMR

EMR = End of Measurement Range      SMR = Start of Measurement Range

**Logic**

- Positive: When the monitored condition occurs, the relevant limit switch (optocoupler) is active.
- Negative: When the monitored condition occurs, the relevant limit switch (optocoupler) is passive.

**Switch-on delay ("DelayTime")**

The tripping of the limit switches can be delayed by activating the switch-on delay, see Fig. 48. If the signal drops below or rises above the limit within the set delay time, the alarm delay is reset again.

If the signal remains beyond the limit for longer than the delay time, the output is then switched. The switch-on delay (Delay) can be set in the range 1 - 9999 ms. Factory setting: 10 ms.

The alarm delay of the two limit switches can be used individually, so that, for example, one channel gives an advance warning whereas the 2<sup>nd</sup> channel brings the system to a standstill.

**Hold period ("KeepTime")**

The hold period describes the time for the active switching output. It can be selected.

Variants: 1/2/5/10/20/50/100/200/500 msec.  
1/2/5/10 sec.

**Resetting the limit switches/LEDs with key combination**

Press the keys ←↓ and ESC.

**Resetting the limit switches/LEDs externally**

The limit switches and LEDs in the display can be reset by a pulse on Pin 4 of the 8-pole DIN socket of the digital I/O, see Fig. 54, see Fig. 56. The input reacts to rising edges on the pulse.

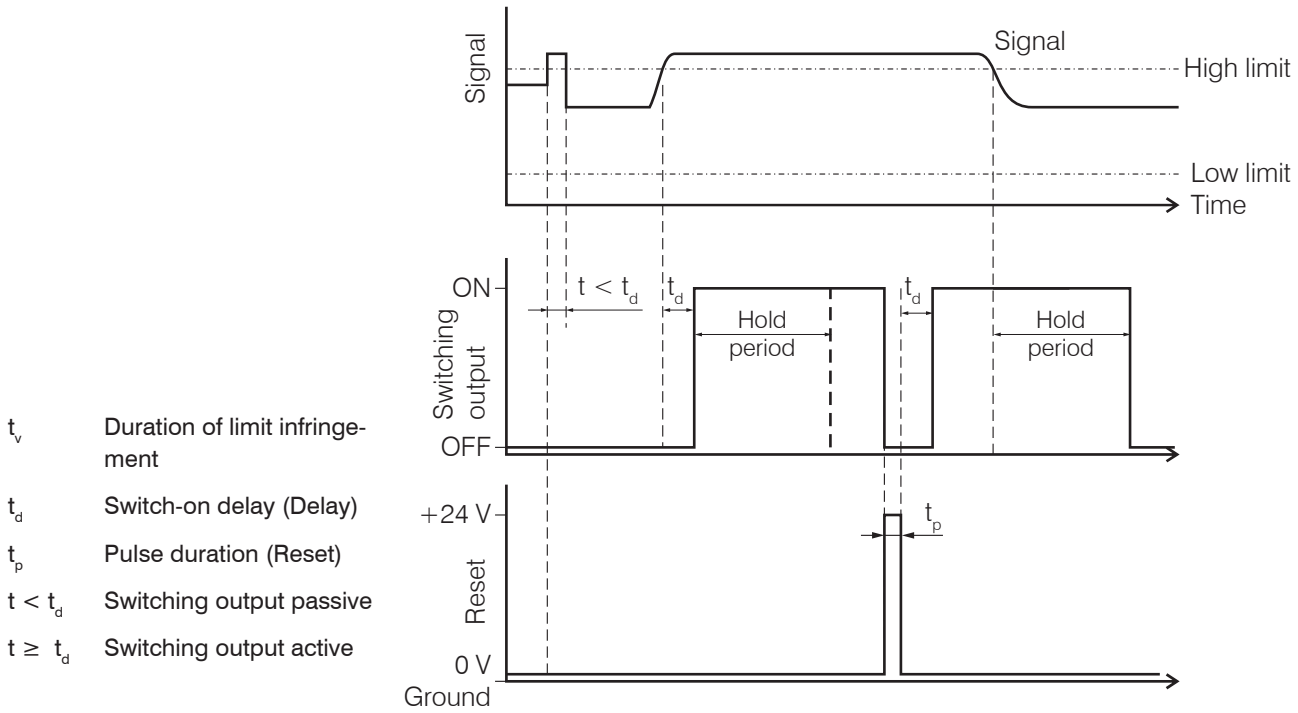


Fig. 48 Timing behavior of the limit monitoring.

**Electrical properties of the switching outputs**

Pins 2 (A) and 8 (B) on the 8-pole DIN socket, see Fig. 56:

- High-Side/Low-Side switch
- Output current: 100 mA max.
- 24 VDC ground DC-isolated from 12/5 VDC ground

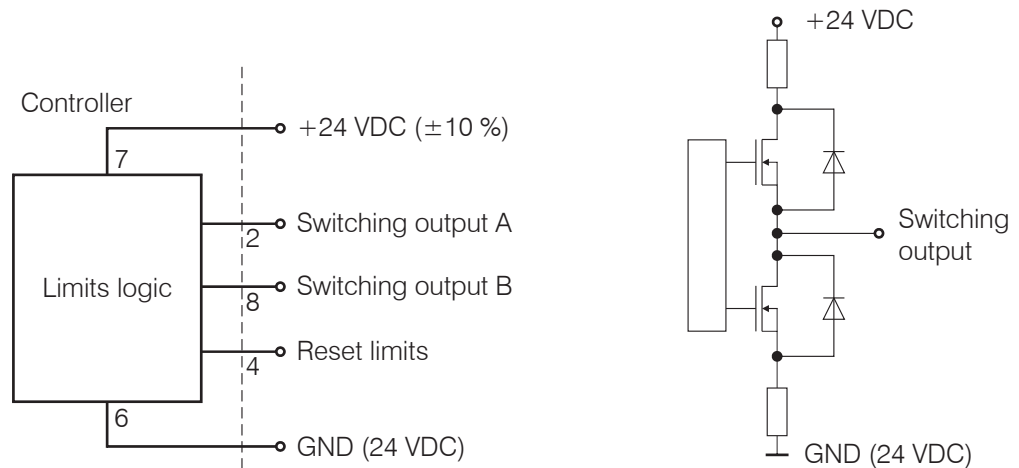


Fig. 49 Wiring of the switching outputs on the controller, 8-pole DIN socket (DIN45326), see Fig. 56

**Level for Reset input**

Pin 4 on the 8- pole DIN socket, see Fig. 56:

- Minimum pulse duration  $t_p$ : 2 ms
- Rising edge: Switching outputs become inactive
- Falling edge: Start of limit checking.

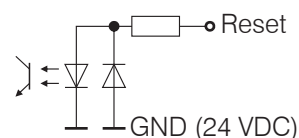


Fig. 50 Input circuit reset input

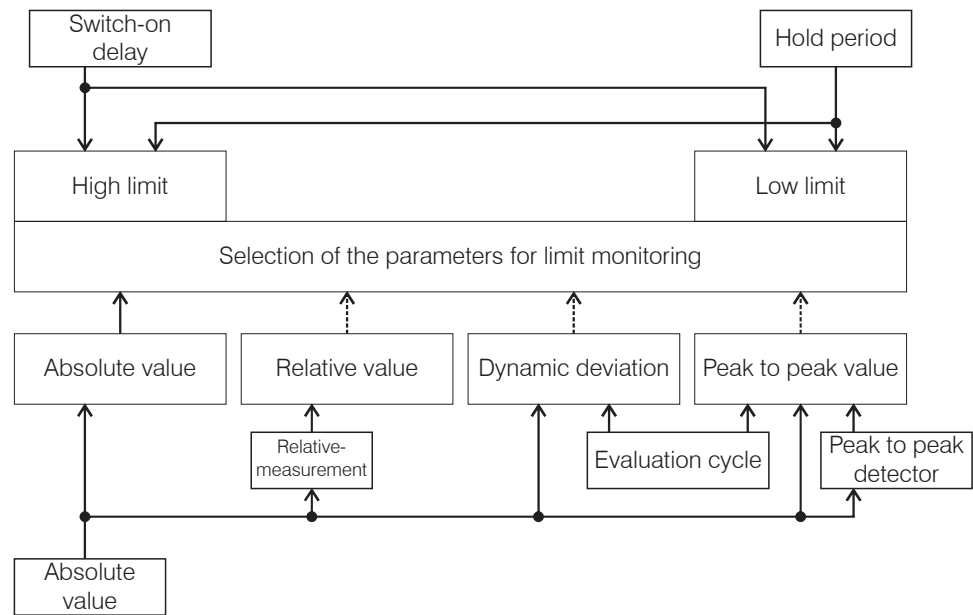


Fig. 51 Block diagram limit monitoring

### 5.8 Starting the Measurement

Starting a measurement:

- ➔ Select the menu point “StartMeas“ from the main menu, see Fig. 52 and press the key ↵.

The system starts with the previous settings (language, active characteristic, et cetera).

Terminating a measurement/return to the main menu:

- ➔ Press the ESC key.

MAIN	StartMess	Adjustment
MENU	Start Ch1	SystCONSTR
eddyNCDT	Start Ch2	Adresses
DT3300	Start Ch3	GenerINFO
Micro-Eps.	StartFCh4	InfoSTART

Fig. 52 Main menu of the eddyNCDT 330x

### 5.9 Synchronization

If a number of measurement channels of the Series 330x are operated with the sensors in close proximity to one another, then mutual influencing is possible due to slightly different oscillator frequencies. This can be avoided by synchronizing the oscillators. To do this the controller must be connected together with the 30 cm long synchronization cable PSC 30 (DT3300) or the ESC30 (DT3301). When connected, the oscillator of the controller 2 (Slave) switches automatically to synchronization mode and operates in dependence of the controller 1 (Master).

Any number of systems can be synchronized to one another by cascading in this way.

- The synchronizing of multiple controllers DT3300 and DT3301 and the requirements for cabling and power supply is described, see Chap. 4.5.

The sensor and the adaptation board are aligned to the target. Thereof result different carrier frequencies.

- ➔ Pay attention to the synchronization, that the controller (sensor) with the highest carrier frequency works as master, see Fig. 53.

The master controller includes an addition besides to the type sign, for example “Sync. Out Master f = 1 MHz” or for example “Sync.Out Slave f = 250 kHz” at the delivery. The same is true also to the use of various slaves: The controller (sensor) with the highest carrier frequency synchronizes a slave with low carrier frequency.

**i** For the synchronization from a 5<sup>th</sup> controller the application of a synchronization divider MCS303 is required.

Sensor	Adaptation board	Target		Carrier frequency			
		non-ferro-magnetic	ferro-magnetic				
ES04	EA3200-ES04M...		X				2 MHz
	EA3200-ES04A...	X					2 MHz
EU05	EA3200-EU05M...		X				2 MHz
	EA3200-EU05A...	X					2 MHz
ES08	EA3200-ES08M...		x				2 MHz
	EA3200-ES08A...	x					2 MHz
ES1	EA3100-ES1M...		X				1 MHz
	EA3050-ES1A...	X			500 kHz		
EU1	EA3100-EU1M...		X				1 MHz
	EA3025-EU1A...	X		250 kHz			
ES2	EA3100-ES2M...		X				1 MHz
	EA3100-ES2A...	X					1 MHz
EU3	EA3100-EU3M...		X				1 MHz
	EA3025-EU3A...	X		250 kHz			
ES4	EA3100-ES4M...		X				1 MHz
	EA3025-ES4A...	X		250 kHz			
EU6	EA3100-EU6M...		X				1 MHz
	EA3025-EU6A...	X		250 kHz			
EU8	EA3050-EU8M...		X		500 kHz		
	EA3025-EU8A...	X		250 kHz			
EU15	EA3025-EU15M...		X	250 kHz			
	EA3025-EU15A...	X		250 kHz			
EU22	EA3025-EU22M...		X	250 kHz			
	EA3025-EU22A...	X		250 kHz			
EU40	EA3025-EU40M...		X	250 kHz			
	EA3025-EU40A...	X		250 kHz			
EU80	EA3025-EU80M...		X	250 kHz			
	EA3025-EU80A...	X		250 kHz			

Fig. 53 Carrier frequencies against sensor and target material

The adaptation of the controllers to the different carrier frequencies happens at Micro-Epsilon.



### 6. Menu Structure

▲		
StartMeas (Start Measuring)		
▲ ▼		
Start Ch1	ZeroSettg	(Relative Measurements)
Start Ch2	Absolute	(Absolute Measurements)
Start Ch3	StndrdDisp	(Standard display)
Start FCh4	Bargraph.D	(Bar display)
▲ ▼	MaxDisplay	(Large display)
▲ ▼	Diagram	
Adjustment	Charact. 1 (Set of characteristics)	Calibrat. (Calibration)
▲ ▼	Charact. 2	ZeroSettg (Relative Measurements)
	Charact. 3	LimSwithA (Limit monitoring A)
	FactCal. 4	GrenzSchB (Limit monitoring B)
		Display
		Output
		LEDfunct. (LED functions)
		Password
		Service
SystCOSTR (Structure of the system)	BaseBoard	
▲ ▼	Adapt.Brd	(Adapter board)
	SensorCbl	(Sensor cable)
	Adapt.SPL	(Specific adaptation)
	Temp.Comp	(Temperature compensation)
	SNo.Review	(Serial numbers)
	Software	(Version)
Adresses	// Adress of MICRO-EPSILON, Navigation with ▲ or ▼	
▲ ▼		
GenerINFO (General Information)	SystCONSTR	(Structure of the system)
▲ ▼	StartMess	(Start Measuring)
	DisplRange	
	Charact. x	(Characteristic 1)
	Fact. Ch4	(Factory setting)
	ZeroSettg	(Relative Measurements)
	LimSwitch	(Limit monitoring)
	Display	
	Password	
	LEDfunct.	(LED function)
	Service	
	InfoStart	
InfoSTART	// Language selection, controller orientation and standard settings	
▼		

#### Functions

▲ ▼	Up/down movement in menus
ESC	Quitting a menu point (return by one hierarchical step), discard input
↵	Calling a menu point or input confirmation

## 7. Warranty

All components of the system have been checked and tested for perfect function in the factory.

In the unlikely event that errors should occur despite our thorough quality control, this should be reported immediately to MICRO-EPSILON.

The warranty period lasts 12 months following the day of shipment. Defective parts, except wear parts, will be repaired or replaced free of charge within this period if you return the device free of cost to MICRO-EPSILON.

This warranty does not apply to damage resulting from abuse of the equipment, from forceful handling or installation of the devices or from repair or modifications performed by third parties.

Repairs must be exclusively done by MICRO-EPSILON.

No other claims, except as warranted, are accepted. The terms of the purchasing contract apply in full.

MICRO-EPSILON will specifically not be responsible for eventual consequential damage.

MICRO-EPSILON always strives to supply its customers with the finest and most advanced equipment. Development and refinement is therefore performed continuously and the right to design changes without prior notice is accordingly reserved.

For translations in other languages, the data and statements in the German language operation manual are to be taken as authoritative.

## 8. Service, Repair

In the event of a defect on the controller, sensor or the sensor cable please send us the affected parts for repair or exchange.

In the case of faults the cause of which is not clearly identifiable, the whole measuring system must be sent back to

MICRO-EPSILON MESSTECHNIK  
GmbH & Co. KG  
Königbacher Strasse 15

94496 Ortenburg / Germany

Tel. +49 (0) 8542 / 168-0

Fax +49 (0) 8542 / 168-90

e-mail [info@micro-epsilon.de](mailto:info@micro-epsilon.de)

[www.micro-epsilon.com](http://www.micro-epsilon.com)

## 9. Decommissioning, Disposal

➡ Disconnect the sensor cable, power supply and output cable on the controller.

The eddyNCDT330x is produced according to the directive 2011/65/EU ("RoHS").

➡ Do the disposal according to the legal regulations (see directive 2002/96/EC).

## Appendix

### A 1 Pin Assignments

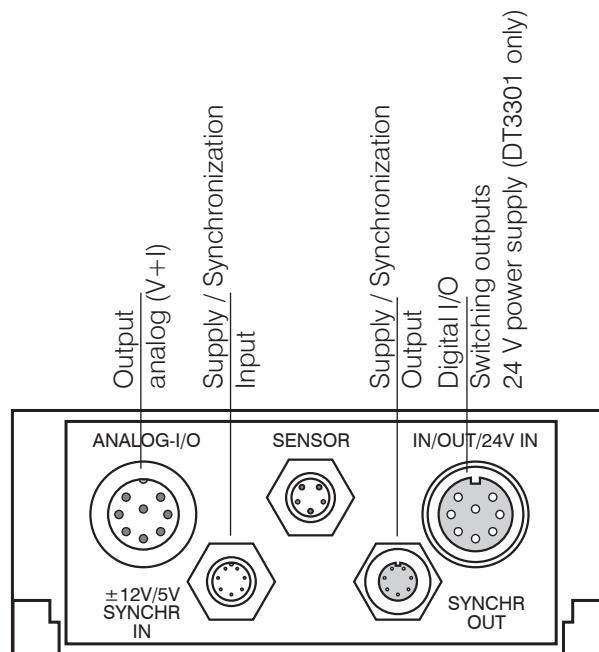
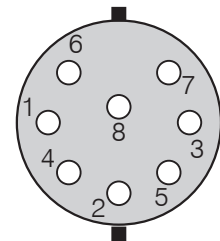
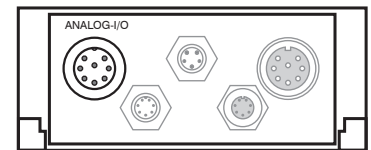


Fig. 54 Plug connections on the controller.

Pin	Assignment	Core color SCA 3/5
1	NC	---
2	NC	---
3	$V_{OUT}$ , min. load 1000 Ohm	brown
4	NC	---
5	$V_{TEMP}$ <sup>1</sup>	green
6	NC	grey
7	AGnd	white
8	$I_{OUT}$ , max. load 400 Ohm	yellow

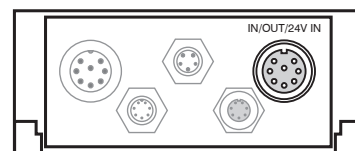


View: Solder-pin side, 8-pole female cable connector

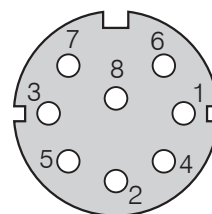
Fig. 55 Analog output on the controller, 8-pole DIN male plug (DIN 45326).

1) Signal available only as an option.

Pin	Assignment	Core color SCD3/8
1	Set zero In	brown
2	Limit A Out, max. 100 mA	yellow
3	NC	blue
4	Reset Limit In	green
5	NC	pink
6	24 VDC ground	white
7	+24 VDC In	red
8	Limit B Out, max. 100 mA	grey



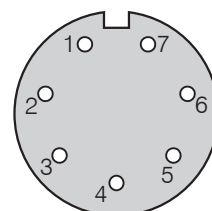
Connect pin 6 (0 VDC) and Pin 7 (+24 VDC) to a power supply for DT3301.



View: Solder-pin side, 8-pole male cable connector

Fig. 56 Switching outputs on the controller, 8-pole DIN female (DIN 45326).

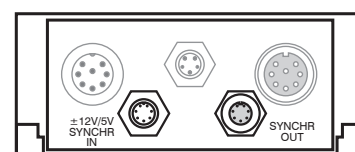
Pin	Assignment	Core color PWC2/4
1	Sync In	---
2	DGnd	black
3	+12 VDC	red
4	AGnd	Connected with pin 2
5	-12 VDC	blue
6	+5 VDC	white
7	DGnd	---



View: Solder-pin side, 7-pole female cable connector (type Binder) ±12V/5V SYNCHR IN

Fig. 57 Supply and synchronization, input, 7-pole Binder plug. Type 712

Pin	Assignment
1	Sync Out
2	DGnd
3	+12 VDC
4	AGnd
5	-12 VDC
6	+5 VDC
7	DGnd



AGnd: Ground for power supply  
DGnd: Ground for synchronisation

Fig. 58 Supply and synchronization, output, 7-pole female Binder socket. Type 712

**CAUTION**

**For DT3301 users:** Do not use the PSC30 for synchronization.

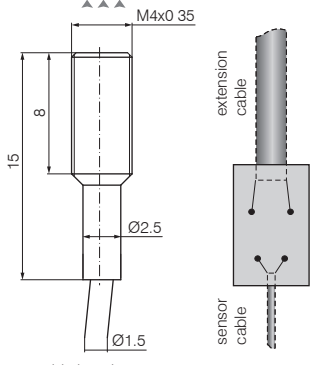
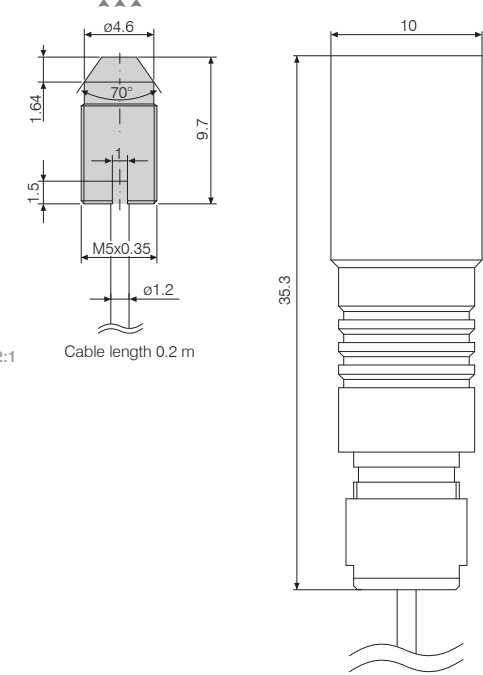
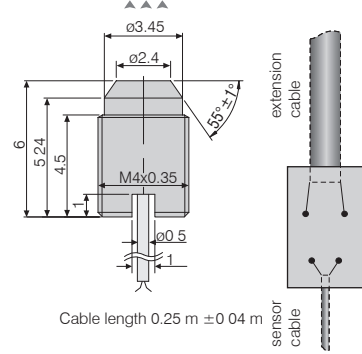
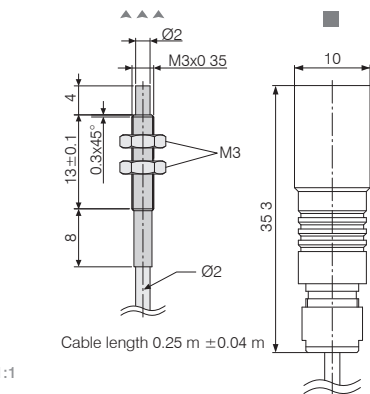
> Damage of the second controller.

➡ Use the ESC30 synchronization cable.

## A 2 Sensor Dimensions

Dimensions in mm (inches), not to scale

<p>1:1 Cable length 0.25 m ± 0.04 m</p>	<p><b>ES04 Shielded Sensor</b>  <b>Measuring range 0.4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\pm 0.04</math> m) (<math>\varnothing</math> 2 mm) with sealed triaxial connector</p> <p>Pressure resistance (static): front 100 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel</p> <p>Sensor cable: ECx, length 6 m</p>
<p>2:1 Cable length 1 m ± 0.15 m</p>	<p><b>ES04/180(25) Shielded Sensor</b>  <b>Measuring range 0.4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 1 m (<math>\varnothing</math> 0.5 mm), short silicon tube at cable exit</p> <p>Pressure resistance (static): front 100 bar</p> <p>Max. operating temperature: 180 °C</p> <p>Housing material: stainless steel</p> <p>Sensor cable: ECx/1 or ECx/2, length <math>\leq 6</math> m</p>
<p>1:1 cable length 0.25 m</p>	<p><b>ES04/180(27) Shielded Sensor</b>  <b>Measuring range 0.4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Pressure resistance (static): front 100 bar</p> <p>Max. operating temperature: 180 °C</p> <p>Housing material: stainless steel</p> <p>Sensor cable: ECx/1, length 6 m</p>
<p>1:1 Cable length 0.25 m ± 0.04 m</p>	<p><b>ES04(34) Shielded Sensor</b>  <b>Measuring range 0.4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 2 mm) with sealed triaxial connector</p> <p>Pressure resistance (static): front 100 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and ceramic</p> <p>Sensor cable: ECx, length <math>\leq 6</math> m</p>
<p><b>Legend:</b></p> <ul style="list-style-type: none"> <li>■ Standard model</li> <li>▲▲▲ Measuring direction</li> <li>▲ Male connector side</li> </ul>	

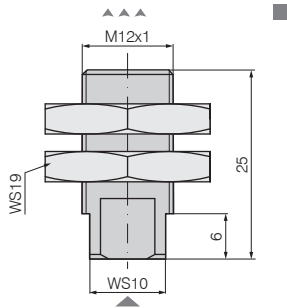
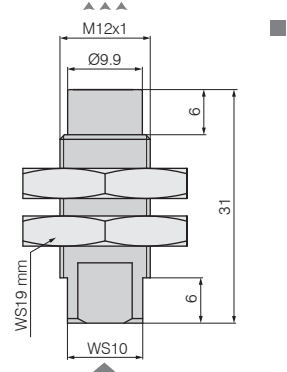
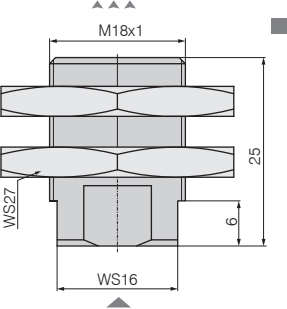
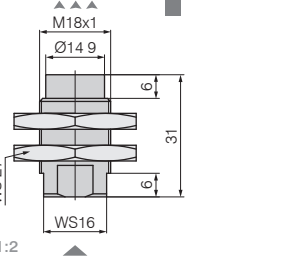
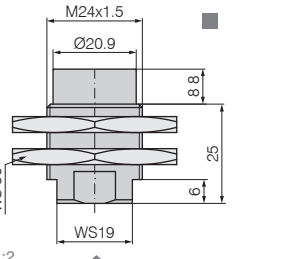
 <p>2:1 (Board 1:1)</p>	<p><b>ES04(35) Shielded Sensor</b>  <b>Measuring range 0.4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable  0.25 m (<math>\varnothing</math> 1.5 mm) with SMC-connector</p> <p>Pressure resistance (static):  front 100 bar / rear side 5 bar</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material:  stainless steel and ceramic</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
 <p>2:1</p>	<p><b>ES04(44) Shielded Sensor</b>  <b>Measuring range 0.4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable  0.2 m (<math>\varnothing</math> 1.2 mm) with sealed triaxial connector</p> <p>Pressure resistance (static):  front 100 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and ceramic</p> <p>Sensor cable: ECx, length <math>\leq</math> 6 m</p>
 <p>3:1</p>	<p><b>ES04(70) Shielded Sensor</b>  <b>Measuring range 0.4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable  0.25 m (<math>\varnothing</math> 0.5 mm) with solder connection board</p> <p>Pressure resistance (static):  front 100 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and ceramic</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
 <p>1:1</p>	<p><b>EU05 Unshielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable  0.25 m (<math>\varnothing</math> 2 mm) with sealed triaxial connector</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and ceramic</p> <p>Sensor cable: ECx, length <math>\leq</math> 6 m</p>

<p>3:1 (Board 1:1)</p>	<p><b>EU05(10) Unshielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and ceramic</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
<p>2:1 (Board 1:1)</p>	<p><b>ES05/180(16) Shielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Max. operating temperature: 180 °C</p> <p>Housing material: stainless steel and epoxy</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
<p>3:1</p>	<p><b>ES05(36) Shielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Connection: integrated coaxial cable 0.5 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and epoxy</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
<p>2:1 (Board 1:1)</p>	<p><b>EU05(65) Unshielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Pressure resistance (static): front 700 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: ceramic</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
<p><b>Legend:</b></p> <ul style="list-style-type: none"> <li>■ Standard model</li> <li>▲▲▲ Measuring direction</li> <li>▲ Male connector side</li> </ul>	

<p>3:1 (Board 1:1)</p>	<p><b>EU05(66) Unshielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Pressure resistance (static): front 400 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: ceramic</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
<p>3:1 (Board 1:1)</p>	<p><b>EU05(72) Unshielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Pressure resistance (static): front 2000 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: ceramic</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
<p>2:1 (Board 1:1)</p>	<p><b>EU05(93) Unshielded Sensor</b>  <b>Measuring range 0.5 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Pressure resistance (static): front 2000 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: ceramic</p> <p>Sensor cable: ECx/1, length <math>\leq</math> 6 m</p>
	<p><b>ES08 Shielded Sensor</b>  <b>Measuring range 0.8 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 2 mm) with sealed triaxial connector</p> <p>Pressure resistance (static): front 20 bar / rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and plastic</p> <p>Sensor cable: ECx</p>
<p>1:1</p>	<p><b>ES1 Shielded Sensor</b>  <b>Measuring range 1 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 3 mm) with sealed triaxial connector</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel</p> <p>Sensor cable: ECx</p>



<p>1:1 cable length 0.25 m ±0.04 m</p>	<p><b>EU1 Unshielded Sensor</b>  <b>Measuring range 1 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\pm 0.04</math> m) (<math>\varnothing</math> 3 mm) with sealed triaxial connector</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and plastic</p> <p>Sensor cable: ECx</p>
<p>1:1 cable length 0.25 m</p>	<p><b>EU1FL Unshielded flat sensor</b>  <b>Measuring range 1 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m with sealed triaxial connector</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: stainless steel and epoxy</p> <p>Sensor cable: ECx</p>
<p>2:1 (Board 1:1)</p>	<p><b>EU1/180(103) Unshielded Sensor</b>  <b>Measuring range 1 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.25 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Pressure resistance (static): front and rear side 20 bar</p> <p>Max. operating temperature: 180 °C</p> <p>Housing material: stainless steel and plastic</p> <p>Sensor cable: ECx/1</p>
<p>2:1 cable length 0.5 m</p>	<p><b>ES1/200 Shielded Sensor</b>  <b>Measuring range 1 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C</p> <p>Connection: integrated coaxial cable 0.5 m (<math>\varnothing</math> 0.5 mm) with transition board</p> <p>Max. operating temperature: 200 °C</p> <p>Housing material: stainless steel and epoxy</p> <p>Sensor cable: ECx/2</p> <p>Special assembly references - please request further drawings</p>
<p><b>Legend:</b></p> <ul style="list-style-type: none"> <li>■ Standard model</li> <li>▲▲▲ Measuring direction</li> <li>▲ Male connector side</li> </ul>	

 <p>1:2</p>	<p><b>ES2 Shielded Sensor</b>  <b>Measuring range 2 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C          Connection: sealed triaxial connector          Pressure resistance (static): front 20 bar / rear side splash water          Max. operating temperature: 150 °C          Housing material: stainless steel and plastic          Sensor cable: ECx</p>
 <p>1:1</p>	<p><b>EU3 Unshielded Sensor</b>  <b>Measuring range 3 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C          Connection: integrated coaxial cable          Pressure resistance (static): front 20 bar / rear side splash water          Max. operating temperature: 150 °C          Housing material: stainless steel and plastic          Sensor cable: ECx</p>
 <p>1:1</p>	<p><b>ES4 Shielded Sensor</b>  <b>Measuring range 4 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C          Connection sealed triaxial connector          Pressure resistance (static): front 20 bar / rear side splash water          Max. operating temperature: 150 °C          Housing material: stainless steel and plastic          Sensor cable: ECx</p>
 <p>1:2</p>	<p><b>EU6 Unshielded Sensor</b>  <b>Measuring range 6 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C          Connection: sealed triaxial connector          Pressure resistance (static): front 20 bar / rear side splash water          Max. operating temperature: 150 °C          Housing material: stainless steel and plastic          Sensor cable: ECx</p>
 <p>1:2</p>	<p><b>EU8 Unshielded Sensor</b>  <b>Measuring range 8 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C          Connection: sealed triaxial connector          Pressure resistance (static): front 20 bar / rear side splash water          Max. operating temperature: 150 °C          Housing material: stainless steel and plastic          Sensor cable: ECx</p>

	<p><b>EU15 Unshielded Sensor</b>  <b>Measuring range 15 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C                  Connection: integrated sealed triaxial connector (ø 10 mm)</p> <p>Pressure resistance (static): front and rear side splash water                  Max. operating temperature: 150 °C                  Housing material: epoxy                  Sensor cable: ECx</p>
	<p><b>EU15(01) Unshielded Sensor</b>  <b>Measuring range 15 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C                  Connection: integrated sealed triaxial connector (ø 10 mm)</p> <p>Pressure resistance (static): front and rear side splash water                  Max. operating temperature: 150 °C                  Housing material: plastics                  Sensor cable: ECx</p>
	<p><b>EU15(05) Unshielded Sensor</b>  <b>Measuring range 15 mm</b></p> <p>Temperature stability <math>\leq \pm 0.025\%</math> FSO/°C                  Connection: integrated sealed triaxial connector (ø 10 mm)</p> <p>Sensor with an elliptical hole to measure through laser optically                  Pressure resistance (static): front and rear side splash water                  Max. operating temperature: 150 °C                  Housing material: epoxy                  Sensor cable: ECx</p>
	<p><b>EU22 Unshielded Sensor</b>  <b>Measuring range 22 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C                  Connection: integrated sealed triaxial connector (ø 10 mm)</p> <p>Pressure resistance (static): front and rear side splash water                  Max. operating temperature: 150 °C                  Housing material: epoxy                  Sensor cable: ECx</p>
<p><b>Legend:</b></p> <ul style="list-style-type: none"> <li>■ Standard model</li> <li>▲▲▲ Measuring direction</li> <li>▲ Male connector side</li> </ul>	

	<p><b>EU40 Unshielded Sensor</b>  <b>Measuring range 40 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C          Connection: integrated sealed triaxial connector (ø 10 mm)</p> <p>Pressure resistance (static):          front and rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: epoxy          Sensor cable: ECx</p>
	<p><b>EU80 Unshielded Sensor</b>  <b>Measuring range 8 mm</b></p> <p>Temperature stability <math>\leq \pm 0.015\%</math> FSO/°C          Connection: integrated sealed triaxial connector (ø 10 mm)</p> <p>Pressure resistance (static):          front and rear side splash water</p> <p>Max. operating temperature: 150 °C</p> <p>Housing material: epoxy          Sensor cable: ECx</p>
<p><b>Legend:</b></p> <p>■</p> <p>▶▶▶▶</p> <p>▲</p>	<p>Standard model</p> <p>Measuring direction</p> <p>Male connector side</p>

### A 3 Cables

Dimensions in mm (inches), not to scale connector

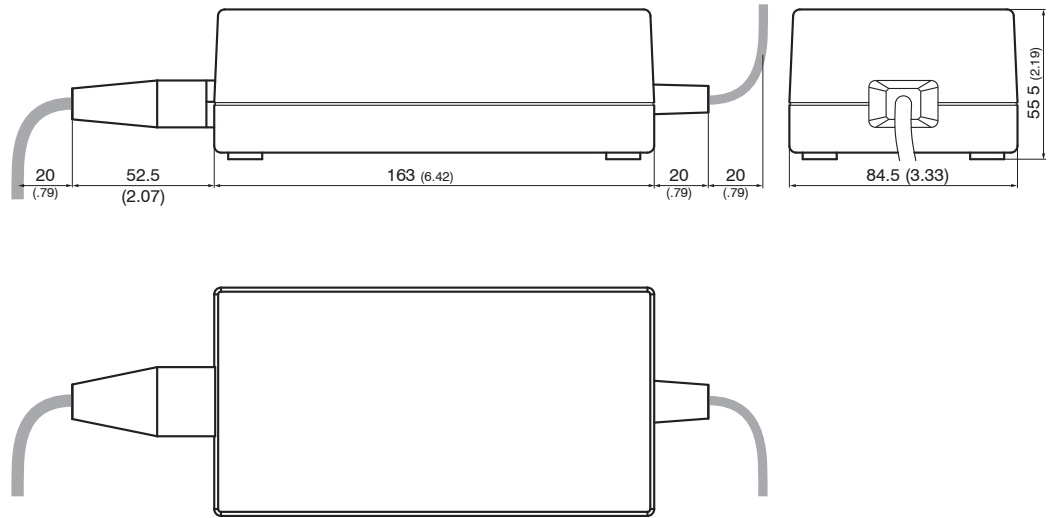
	<p><b>ECx sensor cable,</b> Length is selectable up to <math>x \leq 15</math> m</p>
	<p><b>ECx/1 extension cable for solder connection</b> Sensor connection to transition board, both ends soldered. Length selectable up to <math>x \leq 15</math> m</p>
	<p><b>Transition board for ECx/1</b> both sides for soldering, 16 x 10 x 1.5 mm (included in delivery)</p>
	<p><b>Transition board for ECx/2</b> one side with triax connection socket (included in delivery)</p>
	<p><b>ECx/90 sensor cable with 90° connector (sensor-sided)</b> Length selectable up to <math>x \leq 15</math> m</p>
	<p><b>ECx/2 extension cable with miniature triax connector</b> Solder connection with transition board, sensor cable soldered, extension cable plugged. Length selectable up to <math>x \leq 15</math> m</p>
	<p><b>SCA3/5 signal cable</b> for output signal voltage and current output 4 - 20 mA, with open, tinned ends and eight-pole female connector suitable for DT3300 or DT3301 controller; length 3 m</p>
	<p><b>SCA3/5/BNC signal cable</b> Signal cable analog with BNC-connector for output voltage and tinned ends wires for current output 4 - 20mA, eight-pole female connector suitable for DT3300 or DT3301 controller; length 3 m</p>

	<p><b>SCD3/8 signal cable, switch-input and -output</b></p> <p>with eight-pole male connector, open tinned ends for connecting the reset and / or limit switch output; necessary for 24 VDC supply of DT3301 controller; length 3 m</p>
	<p><b>SIC3(07) signal cable for direct operation with oscilloscope</b></p> <p>Voltage output signal cable with BNC connector; for DT3300 / DT3301 controller; length 3 m</p>
	<p><b>PSC30</b></p> <p>Supply and synchronisation cable for DT3300, length 0.3 m</p>
	<p><b>ESC30</b></p> <p>Synchronisation cable for DT3301 controller, length 0.3 m</p>
	<p><b>PWC2/4</b></p> <p>Power cable, length 2 m, for customers power supply with <math>\pm 12</math> VDC and 5.2 VDC, with tinned ends and 7-pole female cable connector</p>
	<p><b>PPC30</b></p> <p>7-pole male/male connector cable for the feeding of a controller type DT3300 from a power supply type PS300/12/5 through the Power SynchrOut female connector</p>

## A 4 Optional Accessories

### PS300/12/5

Power supply; input 100-240 VAC, output  $\pm 12$  VDC and 5.2 VDC, with integral cable length 1.5 m, for max. 4 multifunction controllers DT3300;



### PS2020

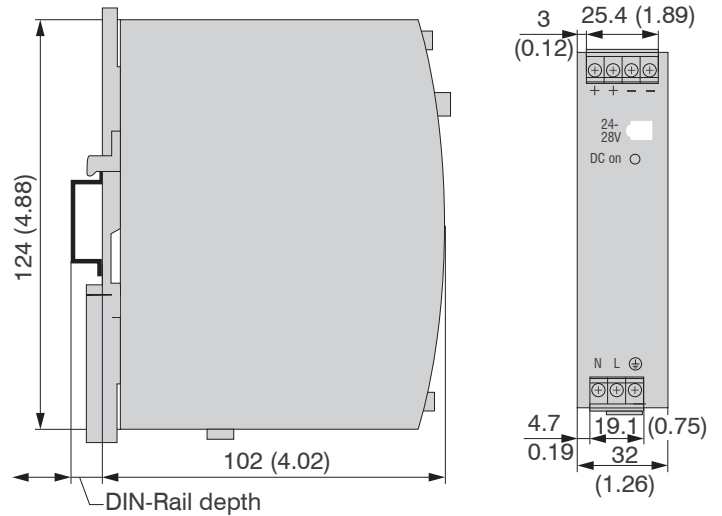
Power supply 24 VDC, for mounting on DIN rail, input 230 VAC, switchable for 110 VAC, for max. 4 multifunction controllers DT3301;

**CAUTION**

Danger of injury by electrical shock.

Connect the power supply in accordance with the safety regulations for electrical equipment.

Dimensions in mm (inches), not to scale



### MCT304

Multi Channel Tower, steel plate frame with aluminium handles, for max. 4 multifunction controllers model DTx300, complete with 100-240 VAC power supply PS300/12/5

### MC2,5

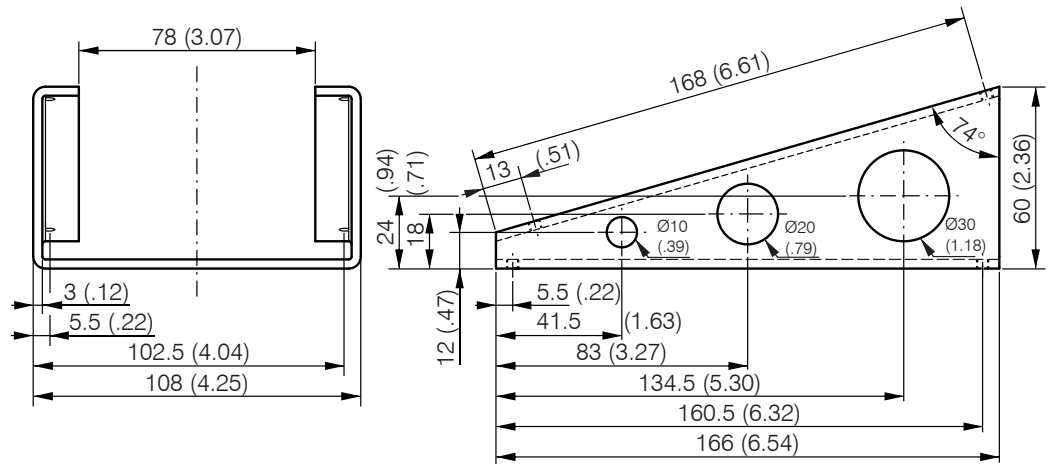
Micrometer calibration fixture, range 0- 2.5  $\mu\text{m}$ , 0.1  $\mu\text{m}$  per division, adjustable zero position, for sensors ES04, EU05, EU1, ES1, ES2

### MC25D

Digital micrometer calibration fixture, range 0.000 - 25.000 mm, adjustable zero position, for sensors ES04 - EU15, reading 1 $\mu\text{m}$

**MBC300**

Mounting base for multifunction Controller DTx300



All threads M4

Dimensions in mm (inches), not to scale



## A 5 Standard Settings

After receipt all 4 characteristics will start at first with standard settings from MICRO-EPSILON. Setting is done in the submenu Adjustment.

No	Parameter	Standard	Customer	grey (= settings)	black (= selection)
1	Language	<b>Deutsch</b>			The system starts with German language.
2	Position	<b>CrossPos</b>			The system starts with display for cross position.
3	Character.	<b>FactCal4</b>			The system starts with the factory calibration 4.
4	CH. Name	Set....1			Name of characteristics is at first Set....1 (or .2 or .3)
5	Display-unit	<b>mm</b>			The unit is valid for display and adjustment for calibration.
6	Display SMR	0.0000			The display starting point is same as for measuring range.
7	Display EMR	<b>EMR</b>			The display range end is same as for measuring range.
8	Calibration	<b>FactCal4</b>			All characteristics start with the factory calibration.
9	ZeroseVal.	0.0000			Output=0.0V(for X.0-0.0V it is X.0 / display=as StartpMR
10	RefLimS.A	<b>Absolute</b>			The limit switch refers to absolute measured values.
11	ModLimS.A	<b>Window</b>			Window between low limit and high limit
12	CyclTimS.A	<b>1 sec</b>			Cycle for peak-to-peak and dynamic deviation detection
13	LogLimS.A	<b>posLogics</b>			Limit switch active for limit exceeding or out of window
14	DlyLimS.A	10 msec			The switch output will be activated after 10 msec exceed.
15	KepLimS.A	<b>1 sec</b>			The switch remain active 1 sec after missing the exceed.
16	HighLimS.A	0,75 * EMR			High limit at 75 % of standard measuring range
17	LowLimS.A	0,25 * EMR			Low limit at 25 % of standard measuring range
18	RefLimS.A	<b>Absolute</b>			The limit switch refers to absolute measured values.
19	ModLimS.B	<b>Window</b>			Window between low limit and high limit
20	CyclTimS.B	<b>1 sec</b>			Cycle for peak-to-peak and dynamic deviation detection
21	LogLimS.B	<b>posLogics</b>			Limit switch active for limit exceeding or out of window
22	DlyLimS.B	10 msec			The switch output will be activated after 10 msec exceed.
23	KepLimS.B	<b>1 sec</b>			The switch remain active 1 sec after missing the exceed.
24	HighLimS.B	<b>EMR</b>			High limit at End of standard measuring Range
25	LowLimS.B	0.000			Low limit at Startpoint of standard measuring Range
26	DISPLAY	<b>Absolute</b>			The absolute meas. value is in main display(Stndrd&Max).
27	DspCycTim	<b>1 sec</b>			Valid for Max.-, Min.-, Pk-Pk- & average value detection
28	Display LP	100 msec			Refreshing time of the display
29	OutputVolt	<b>0 .. +10</b>			0 ..+10 Volt corresponding to the (standard) measuring range
30	LP - Filter	<b>25 kHz</b>			The system starts with 25 kHz low pass filter.
31	Red LED	ON			No (or wrong) sensor / cable
32	Red LED	blinking			Limit switch B activated
33	Yellow LED	ON			Temperature range exceeded
34	Yellow LED	blinking			Limit switch A activated
35	Green LED	ON			All o.k.
36	Green LED	blinking			Other error
37	PasswSetP	0000			In case of 0000 no password protection for Ch1 - Ch3

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