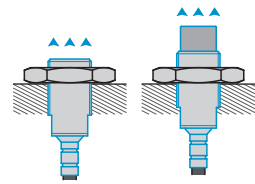


Mounting

The measurement behavior of eddy current displacement sensors can be affected by a metal holder.

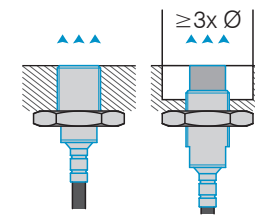
The standard mounting method for the sensor should be used, since you will achieve the best measurement results with this method!

Standard Mounting Method



- Sensors protrude over metal holder
- Corresponds to factory calibration
- To achieve the technical data, the sensor should be mounted in the same way
- Also pay attention to the distance A from the front sensor face to the metal nut.

Flush Mounting Method

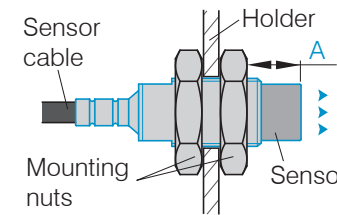


Mounting method does not correspond to factory calibration. Recommended: perform 3-point field linearization

Linearize the measuring system, if possible in exactly the same measurement setup as will be used later for the measurement itself!

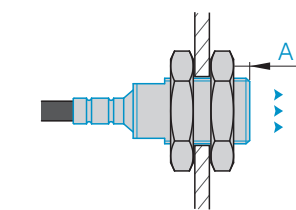
Sensors with Threads

- ➡ Insert the sensor through the hole in the sensor holder.
- ➡ Fasten the sensor.
- ➡ To do so, screw the mounting nuts supplied with the sensor onto the threads protruding from the holder on both sides.
- ➡ Tighten the mounting nuts carefully in order to avoid damage, especially to small sensors.



Unshielded sensor with threads, standard mounting

Sensor	Dimension A
ES-U1	8 mm
ES-U2	8 mm
ES-U3	10 mm
ES-U6	20.4 mm
ES-U8	24.6 mm

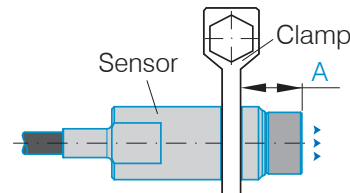


Shielded sensor with threads, standard mounting

Sensor	Dimension A
ES-S1	4 mm
ES-S2	4 mm
ES-S4	4 mm

Sensors Without Threads

- ➡ Preferably mount with a circumferential clamp; alternatively, with a set screw made of plastic.



Sensor	Dimension A
ES-U1-T	7 mm
ES-U3-T	10 mm

Distance between front sensor face and holder, sensors without threads, standard mounting

Using Multiple Sensors

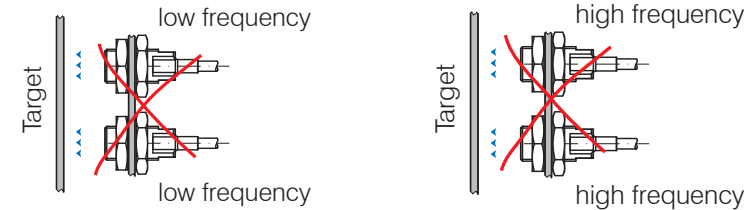
Eddy current sensors generate magnetic fields, which can overlap when the sensors are placed too close together (known as cross-talk).

There are two solutions to avoid this. Either install them with a sufficient minimum distance or use sensors with different frequencies, LF (low frequency) and HF (high frequency).

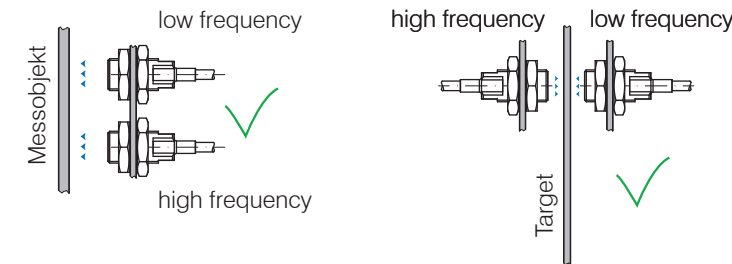
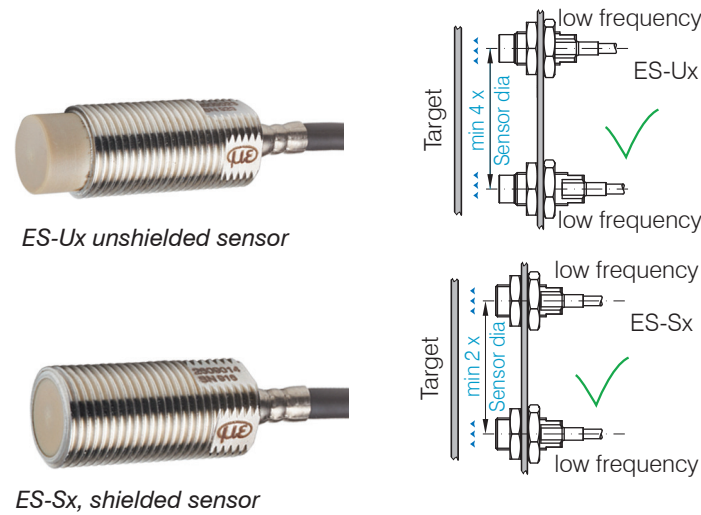
Necessary Distances:

- 4x sensor diameter as distance between two unshielded sensors with the same carrier frequency (e.g. low frequency)
- 2x sensor diameter as distance between two shielded sensors with the same carrier frequency (e.g. low frequency)
- If more than two sensors are placed close to each other, pay attention to the correct sequence (e.g. LF-HF-LF...).

Not possible:



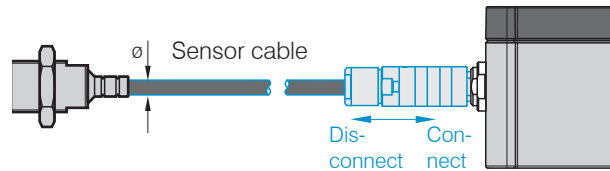
No synchronization required:



Sensor Cable

- ➡ Do not kink the sensor cable. Observe minimum bending radii.
- ➡ Do not subject the sensor cable to any mechanical stresses. For drag chain or robotics applications, the controller must also be attached to the robot.
- ➡ Lay the sensor cable in such a way that no sharp or heavy objects affect the cable sheath.
- ➡ Connect the sensor cable to the controller.
- ➡ Check the plug connections for a tight fit.

The sensor cable must not be shortened. This causes loss of the specified technical data.



Take the connector on the ribbed grips (outer sleeves) and pull it apart. Do not pull on the cable or clamping nut.

d Ø2 mm	d Ø3.6 mm	
10 mm	27 mm	Fixed/static
20 mm	54 mm	Dynamic

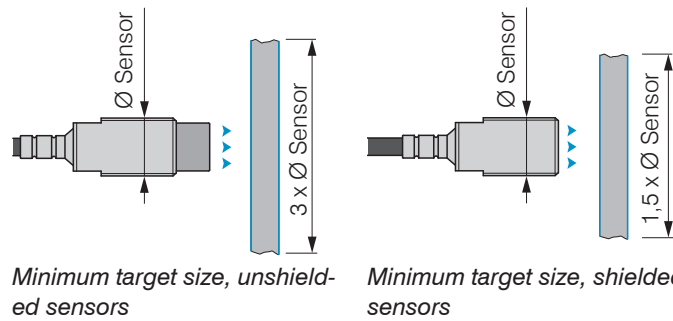
Minimum sensor cable bending radii

Target Size

The relative size of the target relative to the sensor influences the linearity and slope deviation. If the required minimum size of the target is not met:

- The size of the target must not change
- The target must not be moved laterally in relation to the front sensor face

A successful field linearization is also required.



Minimum target size, unshielded sensors

Minimum target size, shielded sensors

Warnings

Connect the power supply and the display/output device according to the safety regulations for electrical equipment.

- > Risk of injury from electric shock
- > Damage to or destruction of the sensor

The supply voltage must not exceed the specified limits.

- > Damage to or destruction of the sensor

Avoid shocks and impacts to the sensor.

Protect the sensor cable against damage.

Proper Environment

Sensor system	DT3020
Protection class	IP 67 (when plugged in)
Temperature range	Operation Storage
	-20 ... +105 °C
Temperature compensation range	+10 ... +105 °C
Ambient pressure	Atmospheric pressure
Humidity	5 ... 95% (non-condensing)

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X9770495-A012075TSw



Setup Guide
eddyNCDT
DT3020/I

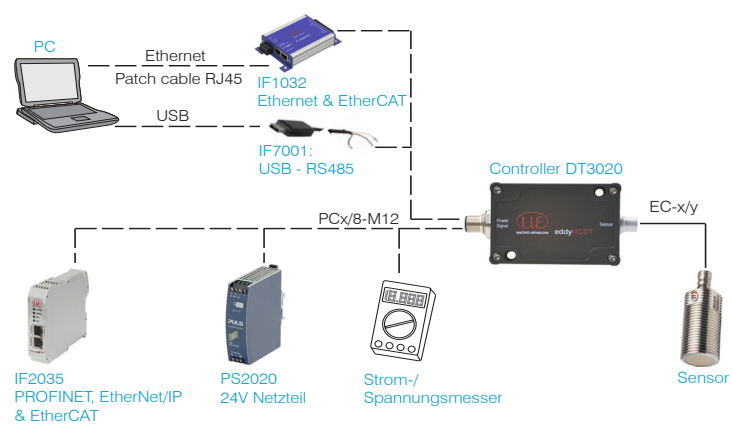


Further information on the controller can be found in the interface instructions:

<https://www.micro-epsilon.com/download-file/man-eddyNCDT-3020--en.pdf>



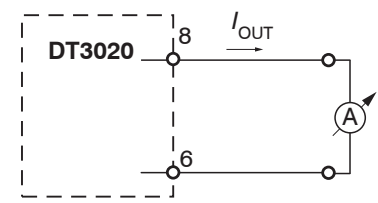
Electrical Connections



Analog Output for Displacement

The controller supplies a current output of 4 ... 20 mA.

➡ Connect the outputs 8 (red) and 6 (pink) on the controller to the measuring device.



Circuit diagram for current output

Pin Assignment

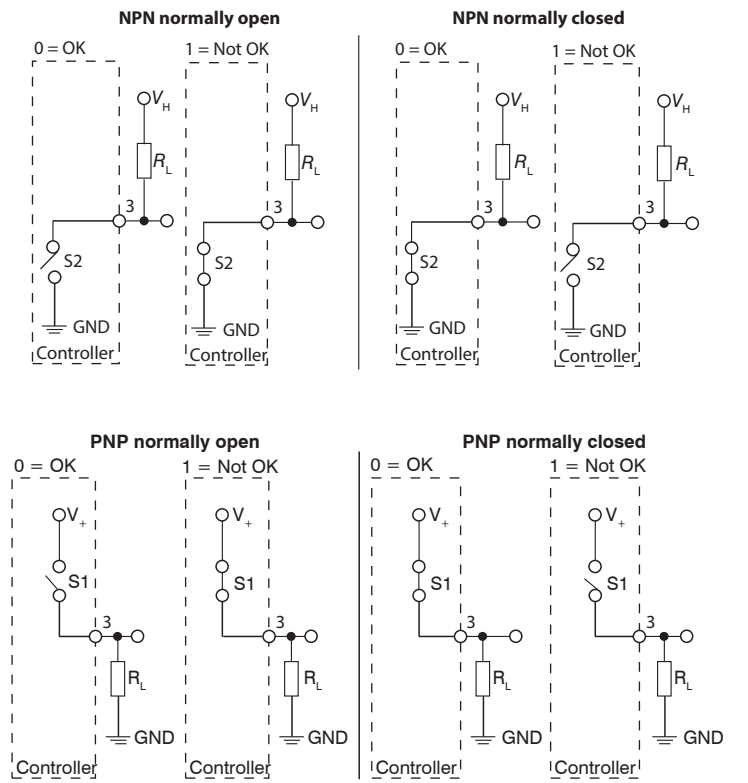
DT3020		
Pin	Description	Wire color PCx/8-M12
1	NC	White
2	12 ... 30 VDC	Brown
3	Switching output	Green
4	RS485 A / +	Yellow
5	RS485 B / -	Gray
6	GND (displacement)	Pink
7	GND (supply)	Blue
8	Distance signal, current output I_{out}	Red

Pin side, 8-pin
housing plug

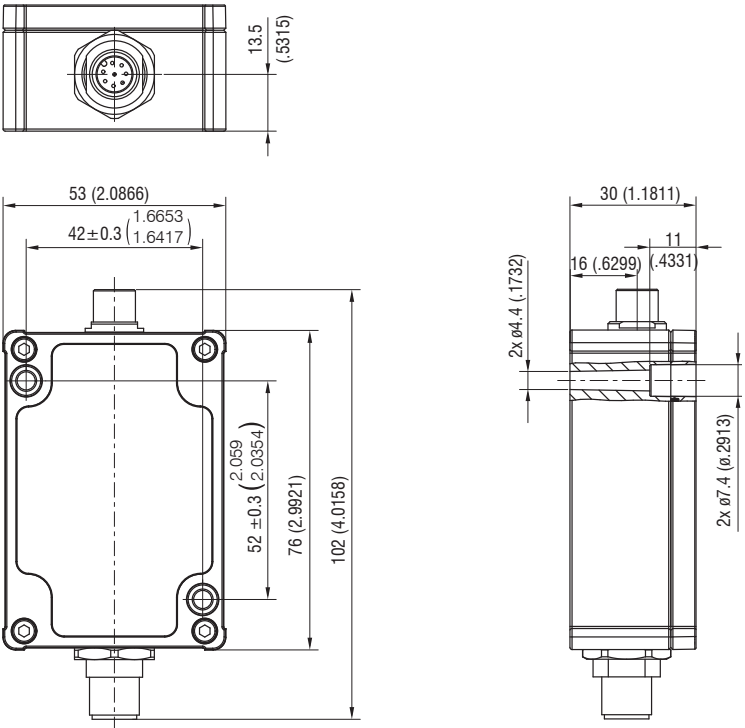
Supply and
analog output, controller,
8-pin plug

Switching Output

The selection of the output type determines the switching behavior of the output, depending on the result of the limit value test. Closed means that the “GND switch” connects the switching output to GND, or, in the case of “Switch Vcc,” the switching output is connected to the operating voltage of the DT3020. The maximum current at the switching output is 100 mA.

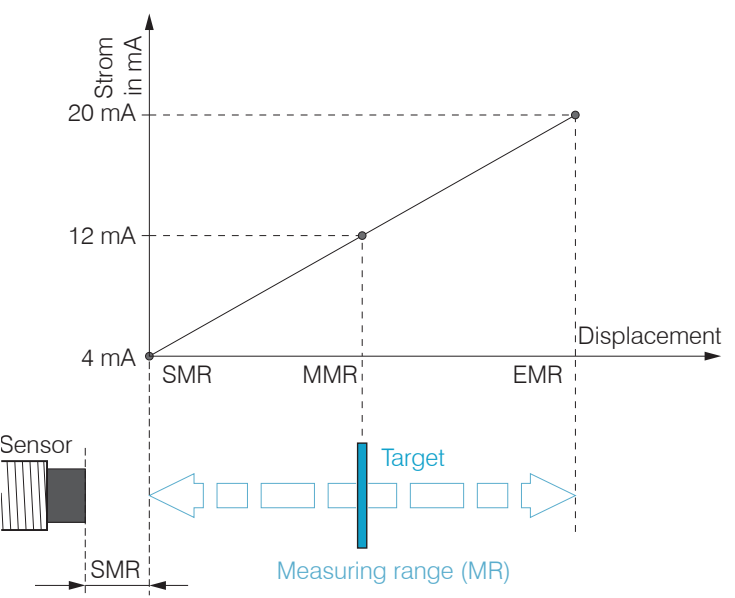


Dimensional Drawing



Controller dimensional drawing, dimensions in mm (inches, rounded off)

Analog Output for Displacement



Standard scaling on delivery

- SMR Start of measuring range
Minimum distance between the front sensor face and the target, sensor-specific
- MMR Mid of measuring range
- EMR End of measuring range (start of measuring range + measuring range)
Maximum distance between front sensor face and target
- MR Measuring range

i The analog output can be freely set between 0 ... 20 mA to the desired measuring range between SMR and EMR.

sensorTOOL

Connections

Sensor group: eddyNCDT

Sensor type: eddyNCDT 302x

Scan Options:
☒ Search serial interfaces
☐ Quick scan RS485
☐ Enable logging

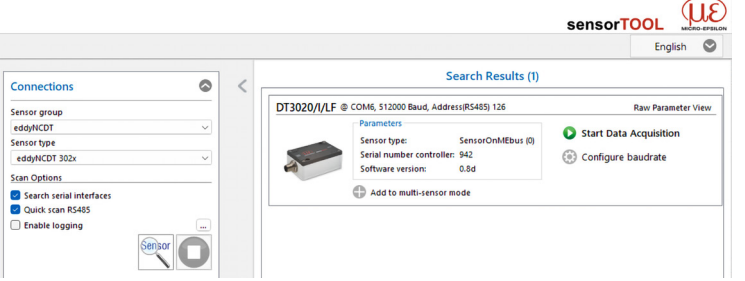
➡ Connect the controller to the PC using a USB-RS485 interface, e.g. IF7001, or using the IF1032 RS485 Ethernet interface.

➡ Start the sensorTOOL program.

➡ Click on the **Sensor** button.

If only 1 DT3020 is connected, the **Quick scan RS485** button can be activated.

➡ Now click the **Start Data Acquisition** button.



Digital Interfaces

The DT3020 can be connected to fieldbuses via various interface modules. Operation using the sensorTOOL software is also possible.

Download sensorTOOL:
<https://www.micro-epsilon.com/service/software-sensorintegration/sensortool/>

Connection to EtherNet or EtherCAT via IF1032/ETH

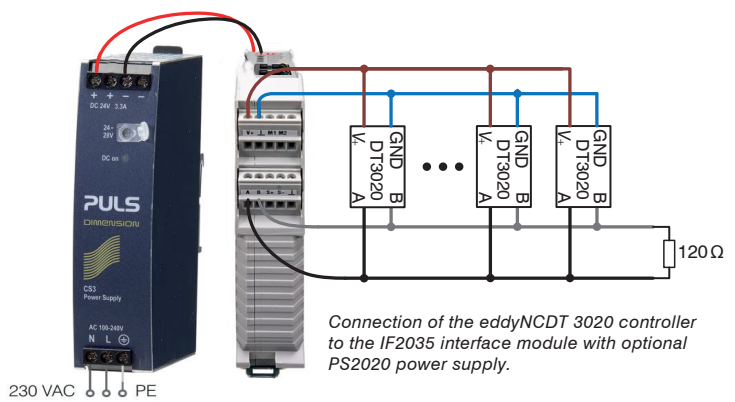
If only 1 sensor is connected to an interface module, the IF1032/ETH interface module is optionally available (Ethernet, EtherCAT). You can find more information online in the interface module operating instructions:

<https://www.micro-epsilon.com/fileadmin/download/manuals/man--IF1032-ETH--en.pdf>

Connection to PROFINET, EtherCAT, Ethernet/IP via IF2035

Up to 32 sensors can be connected to common fieldbuses (PROFINET, EtherCAT, Ethernet/IP) via the optional IF2035 interface module.

➡ Using software such as sensorTOOL, assign unique bus addresses before operating multiple DT3020 controllers on one IF2035. It is not possible to assign addresses directly using the fieldbus.



You can find more information online in the interface module operating instructions:

<https://www.micro-epsilon.com/industry-sensors/interfaces/if2035-for-industrial-ethernet/?sLang=en>