

Version 2.0, 06/2019

ACCOMOS

Acceleration Monitoring System

Operating Instructions



About these operating instructions

These operating instructions contain information about the handling, operation and maintenance of the ACCOMOS acceleration sensor. They contain details about repair and servicing.

If your ACCOMOS acceleration sensor malfunctions or fails during operation, please contact your local dealer (see chapter 9 “Service partners”) or Schaller Automation Industrielle Automationstechnik GmbH & Co. KG, www.schaller-automation.com. Safe and reliable operation of the device is only ensured if the acceleration sensor is operated in accordance with the instructions.

Please observe the following:

- Read these instructions through carefully and familiarize yourself with the correct installation, operation and maintenance of your ACCOMOS.
- ACCOMOS sensors should only be used for the purpose described in the operating instructions.
- Improper maintenance and handling may lead to the device malfunctioning or an unsafe operating environment.
- These operating instructions must be available at the installation location at all times.

Terms and conditions of sale

The respective general terms and conditions of sale of Schaller Automation or the seller of the sensor apply to all

SCHALLER AUTOMATION

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ACCOMOS sensors and associated products. SCHALLER AUTOMATION Industrielle Automationstechnik GmbH & Co. KG does not assume any liability for malfunctions arising as a result of the following:


- a) Normal wear, improper commissioning, improper use/handling, use of an unsuitable power supply, welding processes on the motor or failure to observe instructions relating to commissioning, installation, operation and maintenance as specified in these operating instructions
- b) Use of different components and designs that are not ACCOMOS
- c) Modifications and conversions to the ACCOMOS, carried out by the customer/operator or a third party without the written approval of SCHALLER AUTOMATION Industrielle Automationstechnik GmbH & Co. KG
- d) Incorrect combination or operation of devices and/or components, which are not recognized as being compatible or have not been approved by the manufacturer SCHALLER AUTOMATION Industrielle Automationstechnik GmbH & Co. KG



Safety information

ACCOMOS sensors are manufactured to the high quality standards of SCHALLER AUTOMATION and undergo strict factory testing. To ensure smooth and problem-free operation of the device, the safety information and warnings should be observed by the operator. These are indicated in the operating instructions by the following symbols.

Symbols used	
	Caution! The text in this box must be observed. Failure to observe it may jeopardize the safety of persons or result in damage to the device.
	Attention! This text contains important information.
	This text contains advice for more efficient use.

	Caution! During welding work on the motor, the sensor should be disconnected from the power supply.
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EC declaration of conformity

We, the manufacturer

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declare under sole responsibility that the product:

Type of device: **Acceleration sensor**
Model designation: **ACCOMOS**

to which this declaration relates and which is used exclusively for recording 3-axis mechanical vibrations on non-rotating machine parts, complies with the requirements of EU Directives:

EMC Directive 2014/30/EU
RoHS Directive 20011/65/EU

and the following standards:

EN 60529:1991 +A1:2000 +A3:2013, EN 55022:2010,
EN 61000-4-2:2009, EN 61000-4-3:2011, EN61000-4-4:2013, EN 61000-4-6:2014, EN
ISO 12100:2010, DNVGL-CG-0339:2015
IEC 60068-2-1:2007, 2-2:2007, 2-6:2007, 2-30:2005

Full technical documentation is available. This is a translation of the original operating instructions for the acceleration sensor.

D-66440 Blieskastel, 2017/08/01



Stephan Schaller
- CEO -

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1 Introduction

The ACCOMOS acceleration sensor developed by Schaller Automation is used to monitor and measure mechanical vibrations of machines on non-rotating parts in accordance with DIN ISO 10816.



Attention!

Never use this sensor as a safety device. The sensor is only intended as a control device.

Scope of delivery:

- ACCOMOS sensor
- Sensor protective plate with push screw
- M8 plug-in connector with INBUS key
- GND connecting cable
- M8 to M12 sensor connecting cable (optional)
- Monitoring software (optional)

ACCOMOS function overview

- Detection of critical and non-permissible vibration statuses on three axes

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- Indication when parameterizable thresholds are exceeded via 3-color LED (parameters for RS485 can only be set in the factory)
- Indication of vibration, acceleration and deflection in real time with additional accessories possible
- Recording of static acceleration
- CAN or RS485 interface for digital connection to a display device
- Simple installation using magnetic fixture



2 Installation instructions

2.1 Mechanical installation



Attention!

The surface for sensor installation must be flat and free from dust and grease.

The magnetic sensor fixture has a strong magnetic force! Improper handling may result in skin or fingers becoming crushed.

The strong magnetic field of the sensor fixture can influence the function of pacemakers and defibrillators:

- Pacemakers may switch to test mode and cause discomfort
- Defibrillators may fail completely

If you are wearing such devices, maintain a sufficient distance from the magnetic fixture.

Keep the magnetic fixture away from any devices and objects that could be damaged by strong magnetic fields.



- To avoid injury by crushing skin and fingers, we recommend wearing protective gloves during installation and removal
- During installation and removal, it is necessary to ensure adequate lighting and a stable base at the workplace



Installation:

- Loosen the M8x16 INBUS screw in the center of the sensor and replace it with the M8x30 INBUS screw (**Illustration 1**)
- Use the M8x30 INBUS screw to press the sensor off the sensor protective plate (**Illustration 2**)
- Place the sensor on a flat and clean magnetic base (oil and dirt must be removed beforehand if necessary)
- Remove the M8x30 INBUS screw again so that the sensor sits flat on the installation base (keep the screw with the sensor protective plate safe for transportation purposes - **Illustration 3**)
- To protect the screw opening, insert the M8x16 INBUS screw again and tighten it (**Illustration 4**)
- Connect the supplied ground cable to the next ground point, making the distance as short as possible (**Illustration 5**)
- Check that the sensor is correctly mounted
- Connect the sensor to the power supply (and data bus) using the M8 plug-in connector (**Illustration 6**)

Removal:

- Disconnect the sensor from the power supply (M8 plug-in connector) and the ground cable
- Remove the M8x16 INBUS screw from the center of the sensor and replace it with the M8x30 INBUS screw
- Use the M8x30 INBUS screw to press the sensor off the surface



- Place the sensor on the sensor protective plate
- Remove the M8x30 INBUS screw again so that the sensor sits flat on the sensor protective plate
- To protect the screw opening, insert the M8x16 INBUS screw again and tighten it
- *For safety reasons, never transport a sensor without a sensor protective plate!*

Typical installation points can be found in DIN ISO 10816-1 / DIN ISO 10816-6.



Attention!

Do not reuse sensors with faulty seals on the magnetic mounting plate. Otherwise, there is a possibility of cuts due to splintering of magnetic parts.



Remove central
screw first



Illustration 1: Removing the central screw





Illustration 2: Removing the protective plate with the M8x30 screw



Remove and
store with the
protective plate

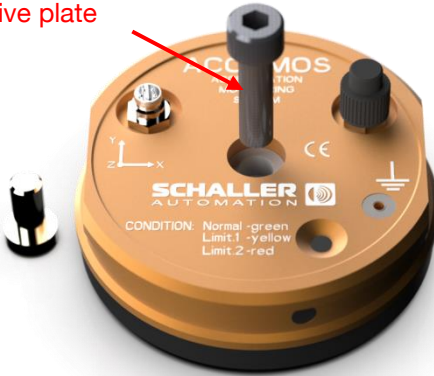


Illustration 3: Removing the M8x30 screw after installation on the motor



Refit central
screw



Illustration 4:

Fitting the central screw



Connect
ground cable

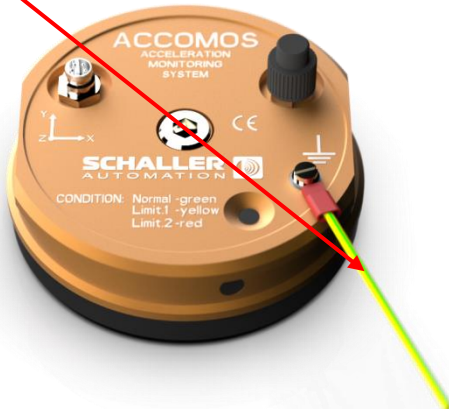


Illustration 5: Connecting the ground cable to the motor

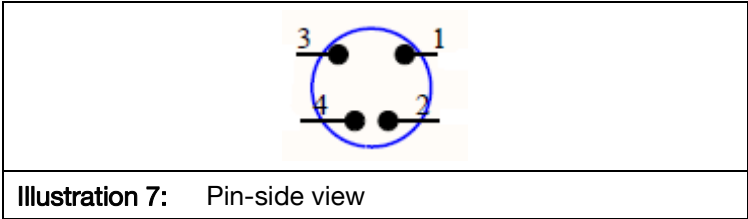




Illustration 6: Connecting the bus cable



2.2 Electrical installation



Pin	Description
1	24 V DC +
2	24 V DC GND
3	CAN-L or RS485 A
4	CAN-H or RS485 B

Table 1: Assignment of the 4-pin M8 plug-in connector (left terminal on sensor)

Pins 3 and 4 are connected internally to a 120 Ohm resistor; therefore, the ACCOMOS should be the last sensor on the bus line.





Warning!

The GND connection on the front of the sensor must be connected to the ground with the shortest possible cable length!

The right M8 plug-in connector is only intended for offset calibration with the supplied M8 6-pin offset connector! No other connection should be made here!

Power supply	9 – 36 V DC, max. 0.11 A
Nominal voltage	24 V DC

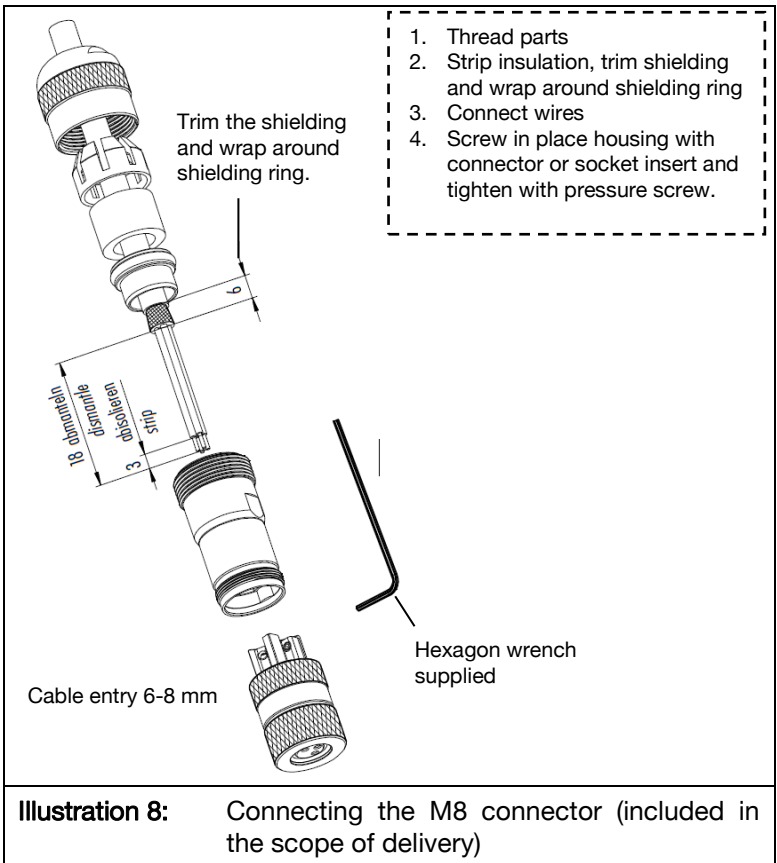
Table 2: Electrical specification

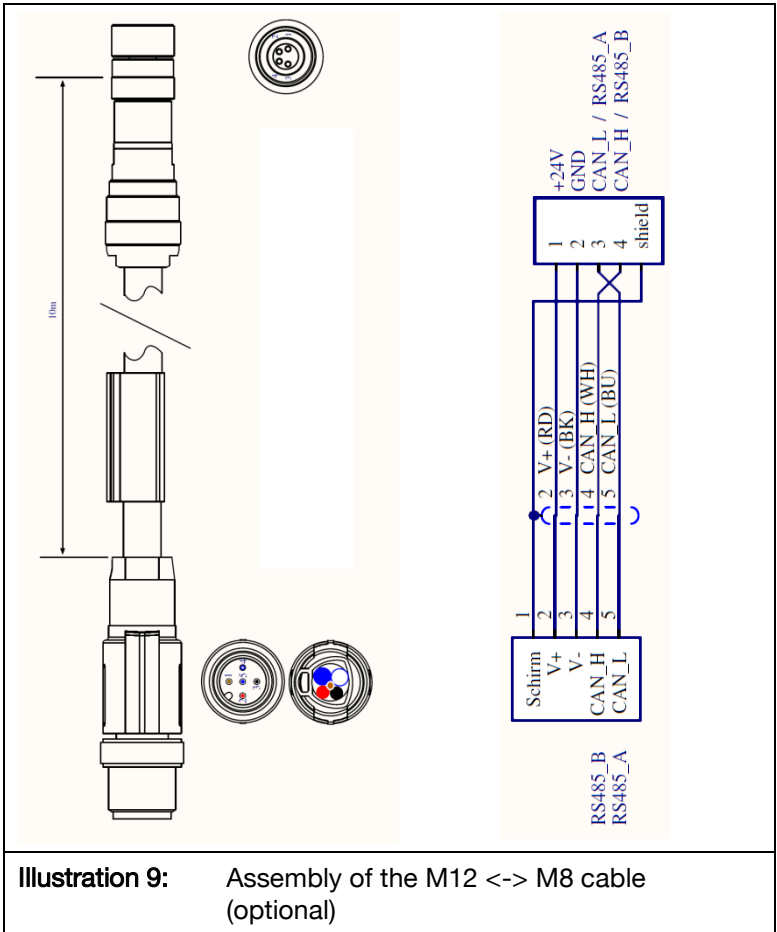
The data cable to be used must be twisted and shielded. We recommend a cable with CAN bus/DeviceNet specification:

2xAWG24/19+2xAWG22/19

(Illustration 9)







The maximum bus length is limited to 100 m.

When the sensor has been connected to a power supply, it immediately and automatically transmits the measurement data to the bus.

3 Commissioning

3.1 LED indication

When the power supply is connected, the LED on the front of the sensor lights up green. The sensor transmits the acceleration values immediately and automatically via RS485 or CAN bus.

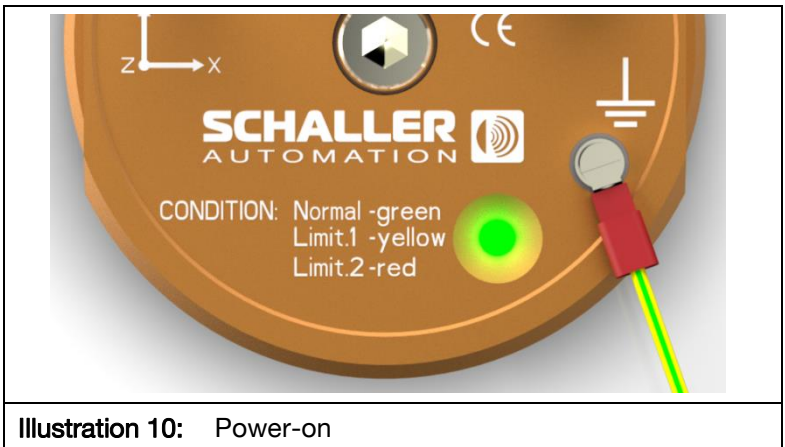


Illustration 10: Power-on



The LED changes color to indicate when two parameterizable thresholds are exceeded:

- LED lights up yellow (default):
Acceleration $\geq 4 \cdot 9.81 \text{ m/s}^2$
- LED lights up red (default):
Acceleration $\geq 8 \cdot 9.81 \text{ m/s}^2$

During initial commissioning, these thresholds come with an offset of 9.81 m/s^2 caused by gravitational acceleration. This offset can be compensated for with the help of the supplied M8 6-pin plug-in connector.

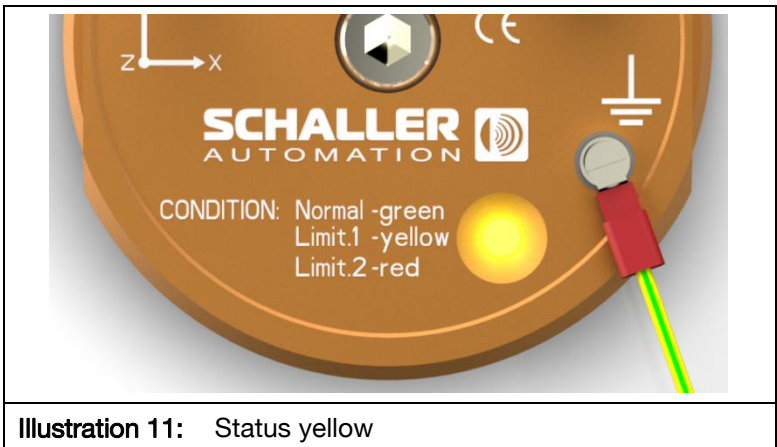




Illustration 12: Status red

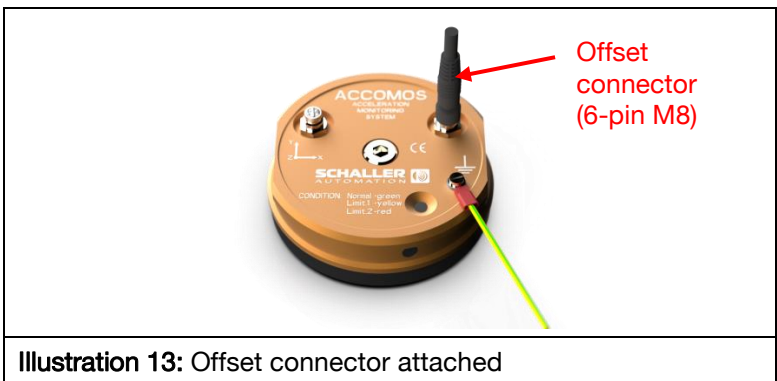


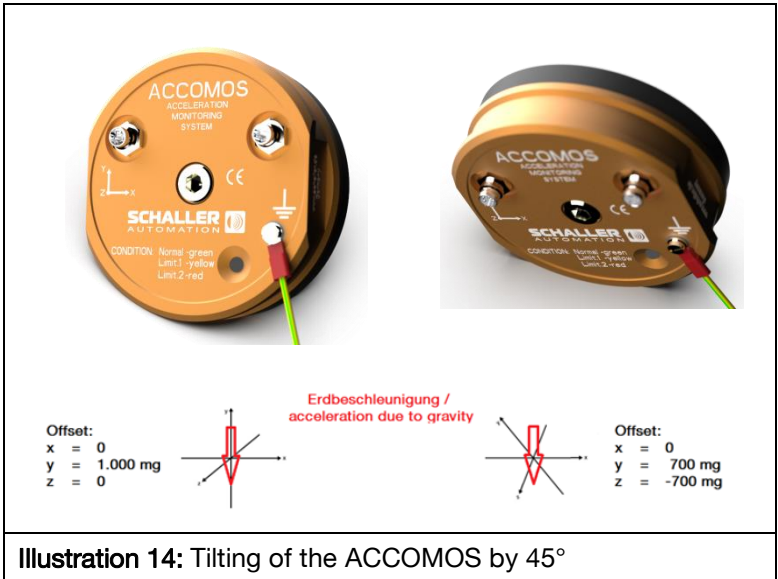
3.2 Offset calibration of the LED display

In order to carry out offset calibration, the sensor must be installed at its permanent operating position.

The sensor must initially be disconnected from the power supply. To calibrate the LED display, the supplied M8 6-pin offset connector is attached to the right M8 connector. The M8 cap is removed first. After the right M8 connector is connected, the power supply is established by connecting the left M8 connector. Offset calibration is made immediately and automatically. The right M8 connector is then disconnected and the M8 cap reattached.

Illustration 14 shows an example of an offset caused by tilting the ACCOMOS by 45° around the x-axis.





The expected offset follows the sine function:

$$\text{Offset} = \sin(\text{tilting angle}) * 1.000 \text{ mg}$$



3.3 RS485 data transfer

Baud rate:	500,000 bit/s
Data length:	8 bits
Stop bits:	2
Parity:	none
Hardware flow control:	none
Data rate:	1500 Msg/s

3.4 CAN data transfer:

Baud rate:	500,000 bit/s
ID for sensor messages (Tx):	0x680 (parameterizable)
ID for parameterization (Rx):	0x681 (parameterizable)
Data rate:	1500 or 3000 messages/s



4 Troubleshooting

Fault	Cause	Remedy
LED off	No power supply Power supply has reverse polarity Power supply is too low	1. Check connection 2. Check connection/ power supply 3. Check power supply
LED green but no bus messages	Cable break Connecting line has reverse polarity Incorrect bus parameters Incorrect bus system (CAN/RS485)	1. Check cables 2. Check connection 3. Check bus parameters 4. Use correct sensor version
Seals on magnetic mounting plate faulty	Wear/cut in seal	1. Replace sensor



5 Function test

After commissioning and connection to a power supply, the LED indicator on the front of the sensor lights up green.



6 Part numbers

Part number	Description
273 400	ACCOMOS – CAN
273 431	ACCOMOS – RS485 class 1
273 432	ACCOMOS – RS485 class 2
273 433	ACCOMOS – RS485 class 3
273 434	ACCOMOS – RS485 class 4
273 435	ACCOMOS – RS485 class 5
273 436	ACCOMOS – RS485 class 6

Table 3: Part numbers

7 Optional spare parts and accessories

Part number	Description	Number per ACCOMOS
151486	Spare parts kit	1

Table 4: Optional spare parts

Part number	Description
310289	Sensor cable M12 <-> M8, assembled

Table 5: Optional accessories



8 Technical data

Mechanical data	
Dimensions	Diameter: 89.5 mm Height: 39.5 mm
Weight	400 g
Indication	3-color LED: <u>Green</u> : Ready for operation <u>Yellow</u> : Acceleration \geq 4,000*9.8 mm/s ² (default) <u>Red</u> : Acceleration \geq 8,000*9.81 mm/s ² (default)
Electrical data	
Power supply	9 V – 36 V DC, max. 0.11 A
Nominal voltage	24 V DC
Cable connection	1 x M8 connector, 4-pin
Communication interface	RS485, galvanically isolated CAN, galvanically isolated
Cable recommendation for communication interface	CAN bus/DeviceNet specified 2xAWG24/19+2xAWG22/19
Measurement range	

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Acceleration	$\pm 16,000 \cdot 9.81 \text{ mm/s}^2$
Frequency	0 – 750 Hz (1500 Hz for CAN bus operation possible)
Sensitivity	$4 \cdot 9.81 \text{ mm/s}^2$
Non-linearity	$\pm 0.5\%$
Crosstalk between axes	$\pm 1\%$
Deviation of sensitivity from ideal	$\pm 1\%$
Ambient conditions	
Operating temperature	-25 to +85°C
Storage temperature	-25 to +85°C
Humidity	Up to 95%
IP rating	IP67

Table 6: Technical data



9 Service partners

Schaller Automation has a global network of service partners in over 130 countries.

A current list of our representatives, including contact data, can be found on our website:

www.schaller-automation.com

Or call our Technical Support department at our head office in Germany:

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