Condition Monitoring for machines and assets

SmartCheck

We pioneer motion

Agenda

1 **Technical Details**

2 Accessories & Material Numbers

3 Trainings

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SmartCheck Overview

SmartCheck:	
Connectors	
2 Analog input	(0-10 V / 0-24 V / 0-20 mA / 4-20 mA), Frequency range: 0-500 Hz, 12 Bit
1 Digital input	(0-30 V, 0,1 Hz-1 kHz)
1 Analog output	(0-10 V / 0-20 mA / 4-20 mA), 12 Bit
1 switching output	(Open-Collector, max. 1 A, 28 V)
Communication	Ethernet 100 Mb/s
Power supply	12-32 VDC; typical 24 VDC; 200mA
Display / operation	1 LED for status- and alarm indication 2 capacitive buttons
Housing	Glass fibre reinforced plastic
Dimensions	44 mm x 57 mm x 55 mm
Weight	ca. 210 g
Protection class	IP 67
Mounting	Hexagon socket screw M6x45 Contact surface on the machine: 25 mm Ø
Temperature range	-20 bis +70 °C ambient -20 bis +85 °C internal
Approvals	CE
Communication protocolls	• OPC/UA Server • SLMP Client • WebServices • MQTT for Schaeffler

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SmartCheck Data acquisition

SmartCheck:	
Internal Sensors	
Schwingung	Acceleration sensor (piezo electric sensor) Frequency range 0,8 Hz - 10 kHz Measurement range ±50 g
Temperature	Measurement range -20 to +70 °C
Measurement	
Measurement functions	Acceleration Velocity and path by integration System temperature Process parameter (e.g. speed, load, pressure)
Diagnostic methods	Time signal, demodulation, spectrum and trend analysis, speed and frequency tracking
Characteristic values (time range and frequency range)	
Predefined Measurement jobs	Base configuration; roller bearing; fan; belt drive; pump; gear stage, etc
Defined characteristic values	DIN/ISO 10816
Calculated characteristic values	RMS, frequency-selective RMS, offset, peak, peak-to-peak, crest factor, Wellhausen count, condition guard, Other user-defined characteristic values are possible.
Signal processing	
Measurement resolution	24 bit (A/D converter)
Frequency range	0,8 Hz - 10 kHz
Frequency resolution	1600, 3200, 6400 or 12800 lines Min. line width 0.0039 Hz at 50 Hz (depending on low-pass)
Memory	64 MB RAM

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Pin assignment

Pin-assignment frontal view SmartCheck

1: Inputs / Outputs   2: Ethernet   3: Power / RS485

Pin assignment	No.	Signal	Colour*
1	1.1	GND inputs	White
	1.2	Digital input	Brown
	1.3	Analogue input 1	Green
	1.4	Analogue input 2	Yellow
	1.5	GND outputs	Grey
	1.6	Analogue output	Pink
	1.7	Digital output	Blue
	1.8	Not connected	Red

Pin assignment	No.	Signal	Colour*
2	2.1	TD+ transmission data	White/orange
	2.2	RD+ received data	White/green
	2.3	TD- transmission data	Orange
	2.4	RD- received data	Green

| Pin assignment	No.	Signal	Colour*
3	3.1	Power supply, earth	White
	3.2	Power supply, positive	Brown
	3.3	RS 485+	Green
	3.4	RS 485-	Yellow
	3.5	Power supply, RTC, positive	Grey
	3.6	Power supply, RTC, earth	Pink
	3.7	Not connected	Blue
	3.8	Not connected	Red

- Standard M12 connectors
- Power over Ethernet (PoE) Power supply over Ethernet Port possible.
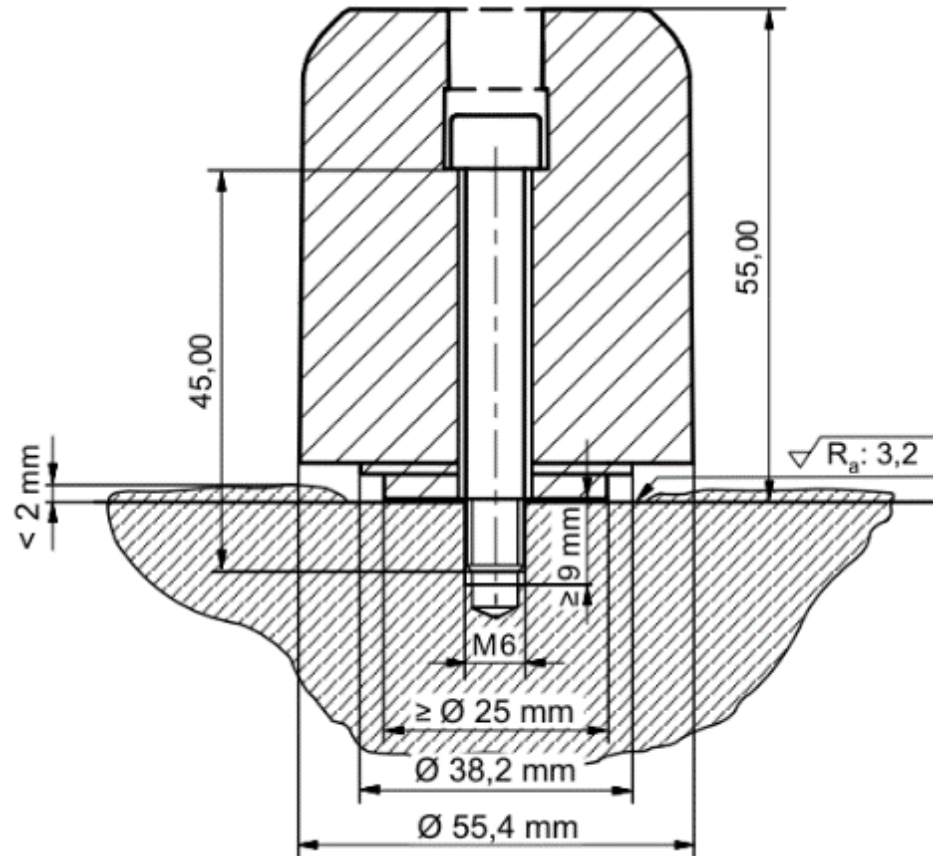
Important:

Router has to support 802.3af Modus A.

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Connection diagram / Galvanic insulation

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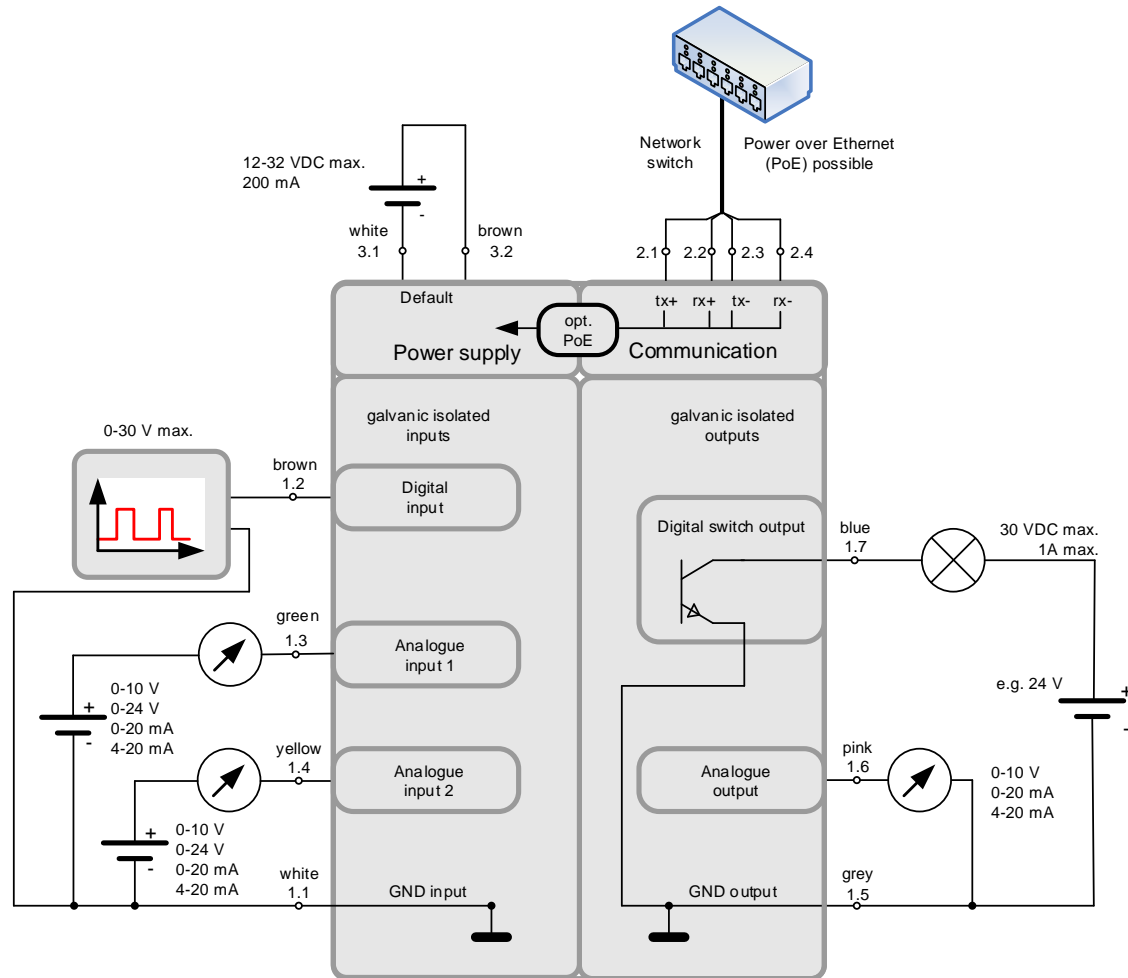
- Power supply 24VDC galvanic insulated
- Communication (Ethernet) galvanic insulated
- Input and output signals are galvanic insulated to power supply and communication

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Dimensions and mounting

Mounting via a M6 inner thread or via a mounting plate made of stainless steel which can be glued direct on the machine

See accessories: link

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Input / Output Cable

EP1 Number	EP1 Designation	Designation
075223295-0000-10	SMART-CHECK.CABLE-IO-P-M12-OE-5M	I/O cable 8-pin for SmartCheck, 5m, M12(m) <-> open ended
075223716-0000-10	SMART-CHECK.CABLE-IO-P-M12-OE-10M	I/O cable 8-pin for SmartCheck, 10m, M12(m) <-> open ended
075223821-0000-10	SMART-CHECK.CABLE-IO-P-M12-OE-20M	I/O cable 8-pin for SmartCheck, 20m, M12(m) <-> open ended
085792748-0000-10	SMART-CHECK.CABLE-IO-P-M12-OE-30M	I/O cable 8-pin for SmartCheck, 30m, M12(m) <-> open ended

Cable start:	8-Pin M12 connector (male)
Cable end:	open
Material:	Polyurethane

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Ethernet Cable

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EP1 Number	EP1 Designation	Designation
087761106-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-0,5M	Ethernet cable for SmartCheck, 0,5m, M12(m) <-> RJ45(m)
088124819-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-2M	Ethernet cable for SmartCheck, 2m, M12(m) <-> RJ45(m)
075218836-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-5M	Ethernet cable for SmartCheck, 5m, M12(m) <-> RJ45(m)
075222922-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-10M	Ethernet cable for SmartCheck, 10m, M12(m) <-> RJ45(m)
075223252-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-20M	Ethernet cable for SmartCheck, 20m, M12(m) <-> RJ45(m)
085792446-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-30M	Ethernet cable for SmartCheck, 30m, M12(m) <-> RJ45(m)
082822522-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-40M	Ethernet cable for SmartCheck, 40m, M12(m) <-> RJ45(m)
085875481-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-50M	Ethernet cable for SmartCheck, 50m, M12(m) <-> RJ45(m)
092669484-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-60M	Ethernet cable for SmartCheck, 60m, M12(m) <-> RJ45(m)
092669514-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-70M	Ethernet cable for SmartCheck, 70m, M12(m) <-> RJ45(m)
092669557-0000-10	SMART-CHECK.CABLE-ETH-P-M12-RJ45-80M	Ethernet cable for SmartCheck, 80m, M12(m) <-> RJ45(m)

Cable start:	4-Pin M12 connector D-coded (male)
Cable end:	open
Material:	Polyurethane

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Power supply

EP1 Number	EP1 Designation	Designation
093143893-0000-10	SMART-CHECK.POWER-SUPPLY-24V	Wall plug power supply for Schaeffler SmartCheck. 24V/DC - 1000 mA - M12 plug - Wide Input Range AC 90 V to 264 V - Temperature: Operating: 0 °C- 40 °C
075224160-0000-10	SMART-CHECK.CABLE-POW-P-M12-OE-5M	Power cable 8-pin for SmartCheck 5m; M12(f) <-> open ended
075224194-0000-10	SMART-CHECK.CABLE-POW-P-M12-OE-10M	Power cable 8-pin for SmartCheck 10m; M12(f) <-> open ended
075224577-0000-10	SMART-CHECK.CABLE-POW-P-M12-OE-20M	Power cable 8-pin for SmartCheck 20m; M12(f) <-> open ended
085792713-0000-10	SMART-CHECK.CABLE-POW-P-M12-OE-30M	Power cable 8-pin for SmartCheck 30m; M12(f) <-> open ended

Wall plug power supply

Cable start:	8-Pin M12 plug (female)
Cable end:	open
Material:	Polyurethane

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Extension cable for Input / Output

EP1 Number	EP1 Designation	Designation
076930866-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-0,5M	Extension cable 8-pin for SmartCheck, 0,5m, M12(m) <-> M12(f)
081483961-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-1M	Extension cable 8-pin for SmartCheck, 1m, M12(m) <-> M12(f)
081484259-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-3M	Extension cable 8-pin for SmartCheck, 3m, M12(m) <-> M12(f)
076932613-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-5M	Extension cable 8-pin for SmartCheck, 5m, M12(m) <-> M12(f)
076934020-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-10M	Extension cable 8-pin for SmartCheck, 10m, M12(m) <-> M12(f)
076934322-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-15M	Extension cable 8-pin for SmartCheck, 15m, M12(m) <-> M12(f)
076934667-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-20M	Extension cable 8-pin for SmartCheck, 20m, M12(m) <-> M12(f)
076935019-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-30M	Extension cable 8-pin for SmartCheck, 30m, M12(m) <-> M12(f)
087121824-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-40M	Extension cable 8-pin for SmartCheck, 40m, M12(m) <-> M12(f)

Cable start: 8-Pin M12 plug (male)

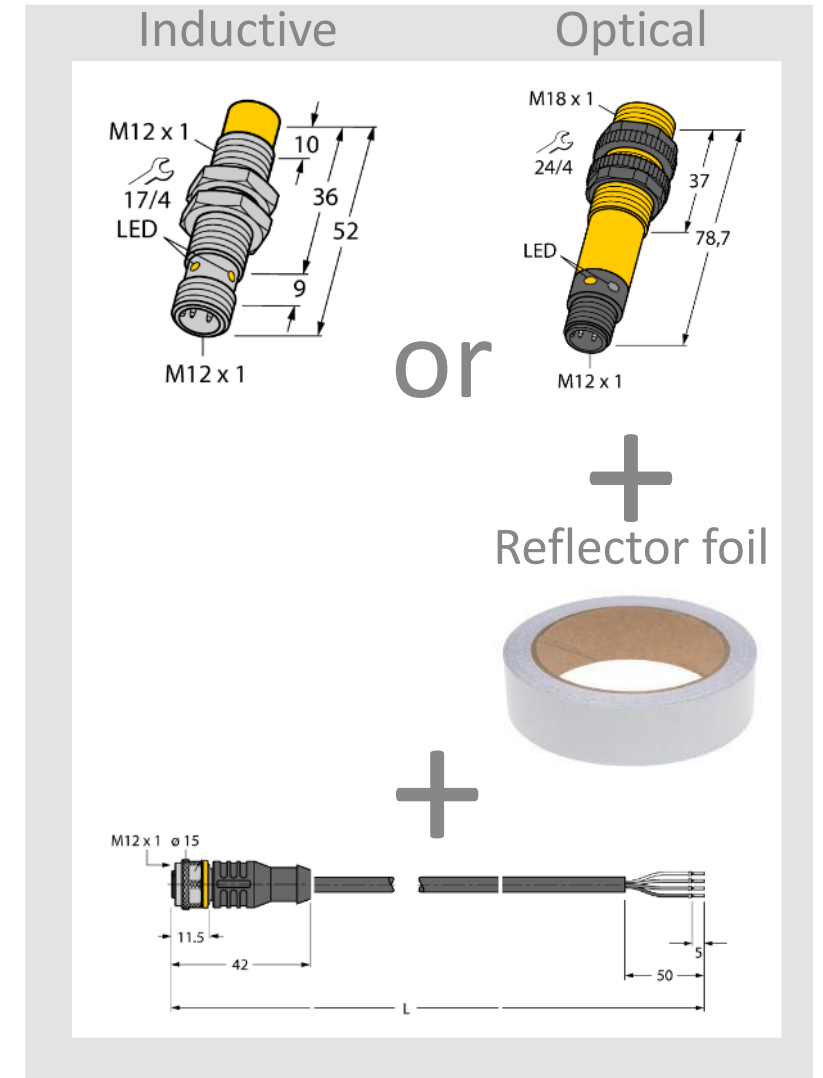Cable end: 8-Pin M12 plug (female)

Material: Polyurethane

Extension cable for power supply

EP1 Number	EP1 Designation	Designation
087187728-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-4P-5M	Extension cable 4-pin for speed sensor, 5m, M12(m) <-> M12(f)
084745762-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-4P-10M	Extension cable 4-pin for speed sensor, 10m, M12(m) <-> M12(f)
087187876-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-4P-15M	Extension cable 4-pin for speed sensor, 15m, M12(m) <-> M12(f)
087187922-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-4P-20M	Extension cable 4-pin for speed sensor, 20m, M12(m) <-> M12(f)
087187957-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-4P-30M	Extension cable 4-pin for speed sensor, 30m, M12(m) <-> M12(f)
087119714-0000-10	SMART-CHECK.CABLE-80C-P-M12-M12-4P-40M	Extension cable 4-pin for speed sensor, 40m, M12(m) <-> M12(f)

Cable start:	4-Pin M12 plug (male)
Cable end:	4-Pin M12 plug (female)
Material:	Polyurethane

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Montage Adapter für SmartCheck

EP1 Number	EP1 Designation	Designation
021942781-0000-10	SENSOR.FIX-PLATE-M6	Mounting shims for glueing, diameter: 25mm, height: 13mm, M6- inner thread
020961278-0000-10	SENSOR.PLATE-GLUE	Adhesive to glue mounting shims
021940274-0000-10	SENSOR.MAGNET-CURVED-M6	Standard magnet for curved surfaces 1/4-28, 47mm - suitable for Schaeffler SmartCheck - temperature range +204 °C - 51 lbs. (23 kg) adherence strength, 19,1mm hight, diameter: 35,5mm - M6 inner thread

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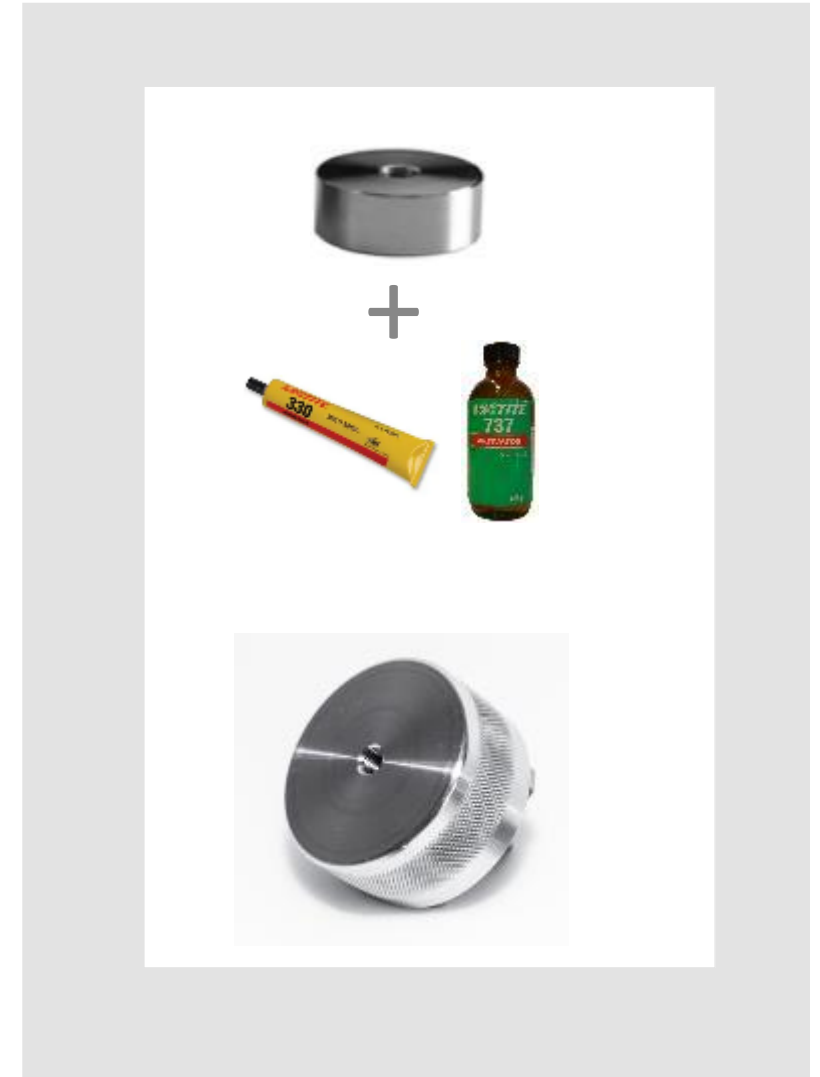
Speed Measurement

EP1 Number	EP1 Designation	Designation
056784953-0000-10	DTECTX1.SENSOR-SPEED-INDU	Inductive speed sensor
056790082-0000-10	DTECTX1.SENSOR-SPEED-OPT	Optical speed sensor
056790139-0000-10	DTECTX1.SENSOR-SPEED-REFL	Reflector foil for optical speed sensor; 9 Meter
058299009-0000-10	DTECTX1.SENSOR-SPEED-CABLE-10M	Cable for speed sensor; 10m; open ended

Inductive

Optical

or

+

Reflector foil

+

SmartLamp

EP1 Number	EP1 Designation	Designation
083722238-0000-10	SMART-CHECK.LAMP	Lamp for external visualization of the state of alarm of a Schaeffler SmartCheck. Easy connection via Plug & Play without any additional clamps or configuration. - for 24V power supply - colours: green; yellow; red - wall mounting bracket - LED low power technique - IP65

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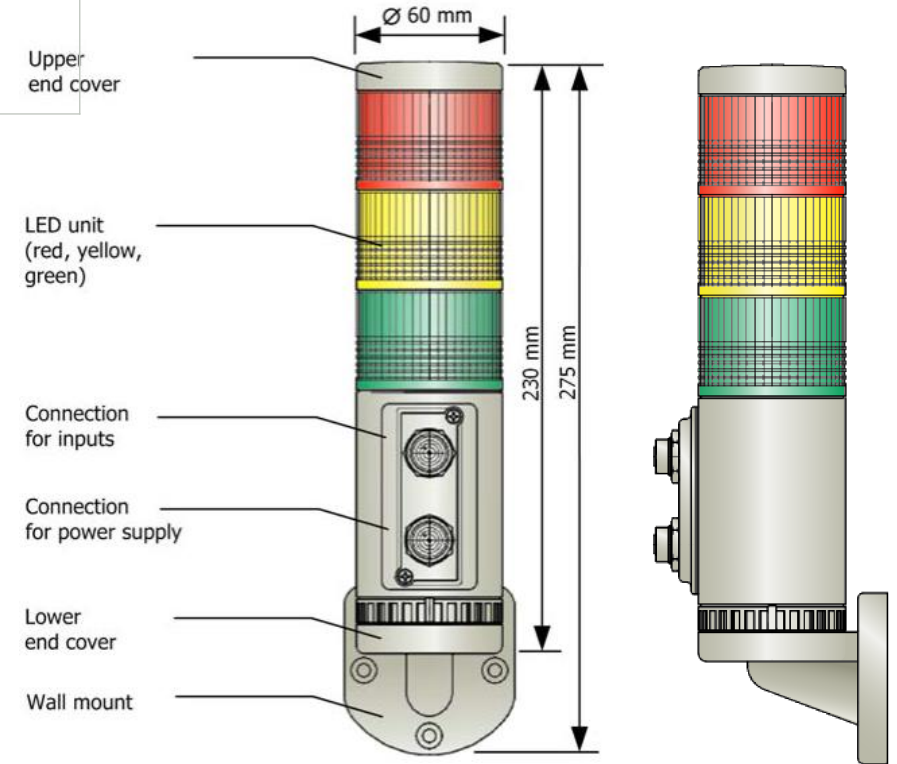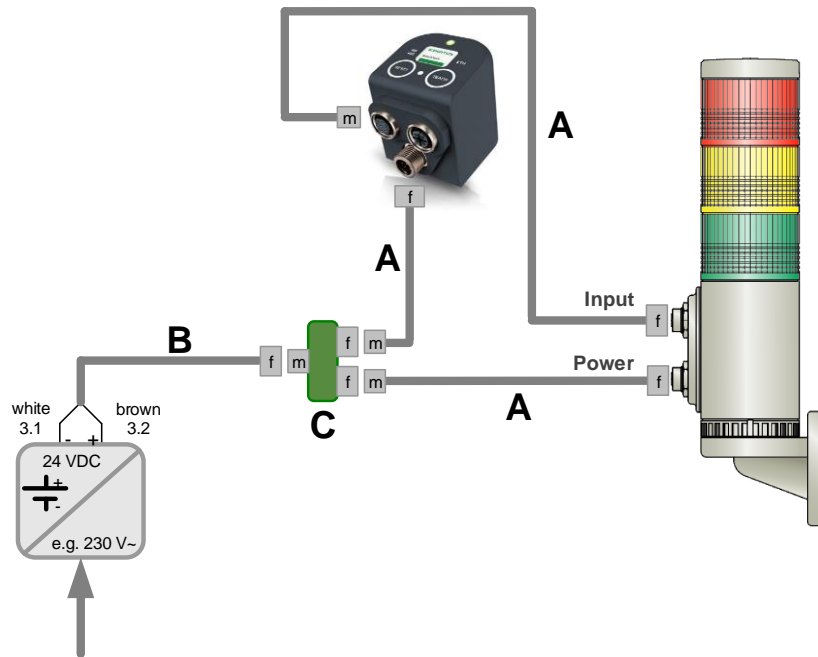
SmartConnectBox

EP1 Number	EP1 Designation	Designation
084571195-0000-10	SMART-CHECK.CONNECT-BOX	SmartConnectBox for easy distribution of I/O signals and power supply to max. 4 FAG SmartCheck, 1 FAG SmartLamp and 1 tacho probe - 4 Schaeffler SmartCheck suitable for connection - 1 FAG SmartLamp suitable for connection - 1 tacho probe suitable for connection - 2 analog Input - 4 analog output - 1 switching output - suitable for 24 V power supply - dimensions: 250mm * 90mm * 80mm - IP65

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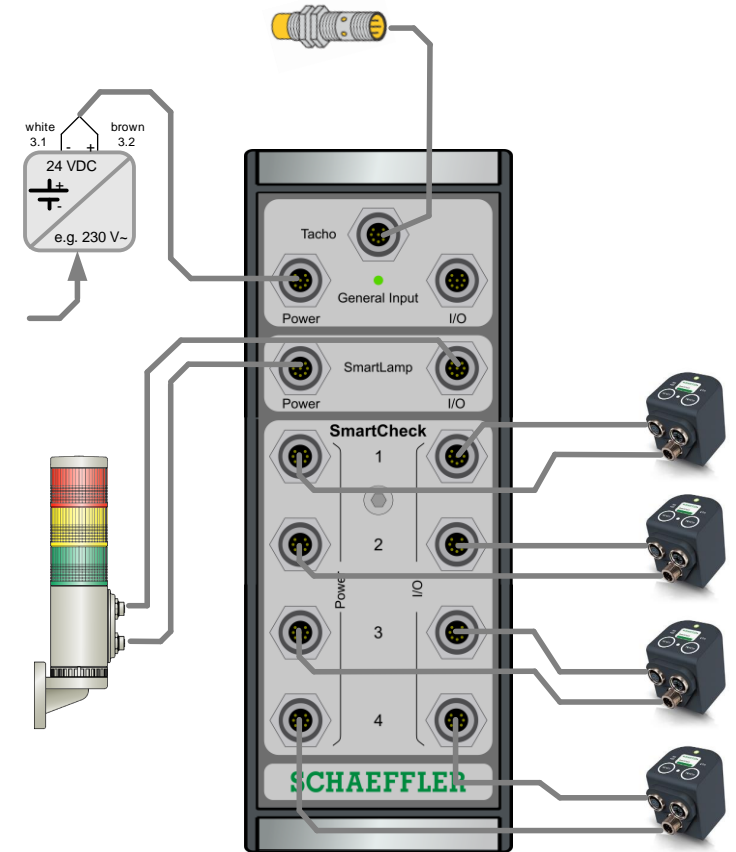
SmartVisual Software

EP1 Number	EP1 Designation	Designation
083120386-0000-10	SMART.VISUAL	Plant Visualization for Schaeffler SmartCheck and ProLink The SmartVisual offers the following functionalities: - visualization of Schaeffler SmartCheck device status - direct hyperlink to the web server of the device - unlimited hierarchical levels possible - unlimited amount of Schaeffler SmartCheck devices possible

Simple plant visualization for SmartCheck and ProLink CMS
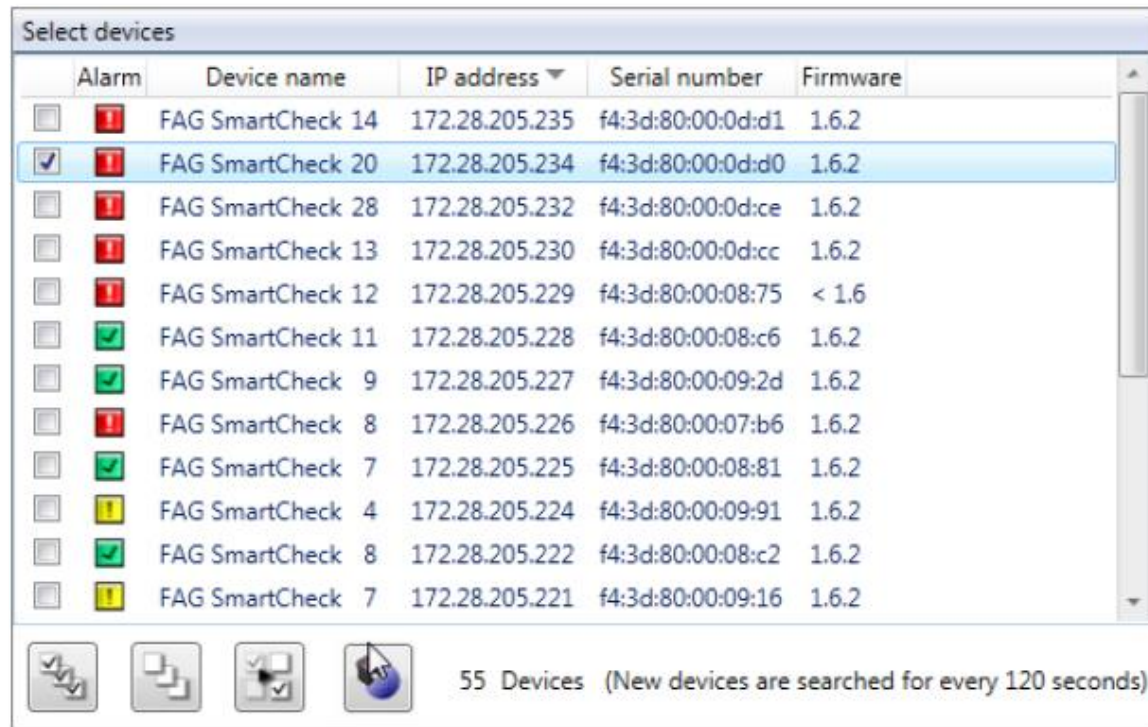
60 days trial test for free

Single-user licence

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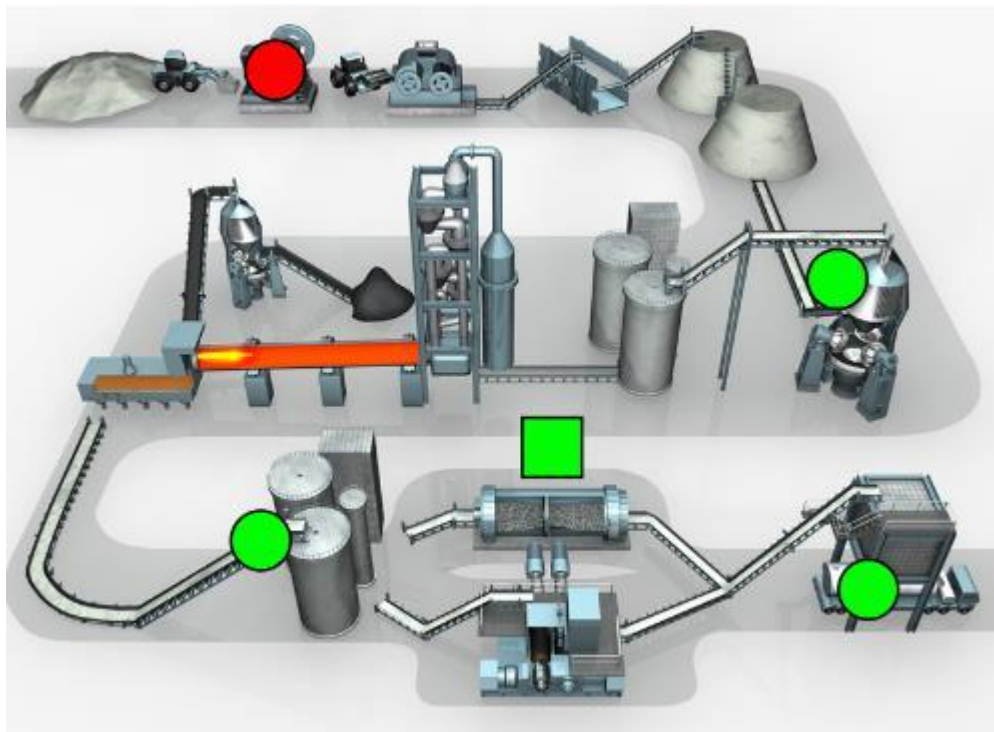
SmartUtility light Software

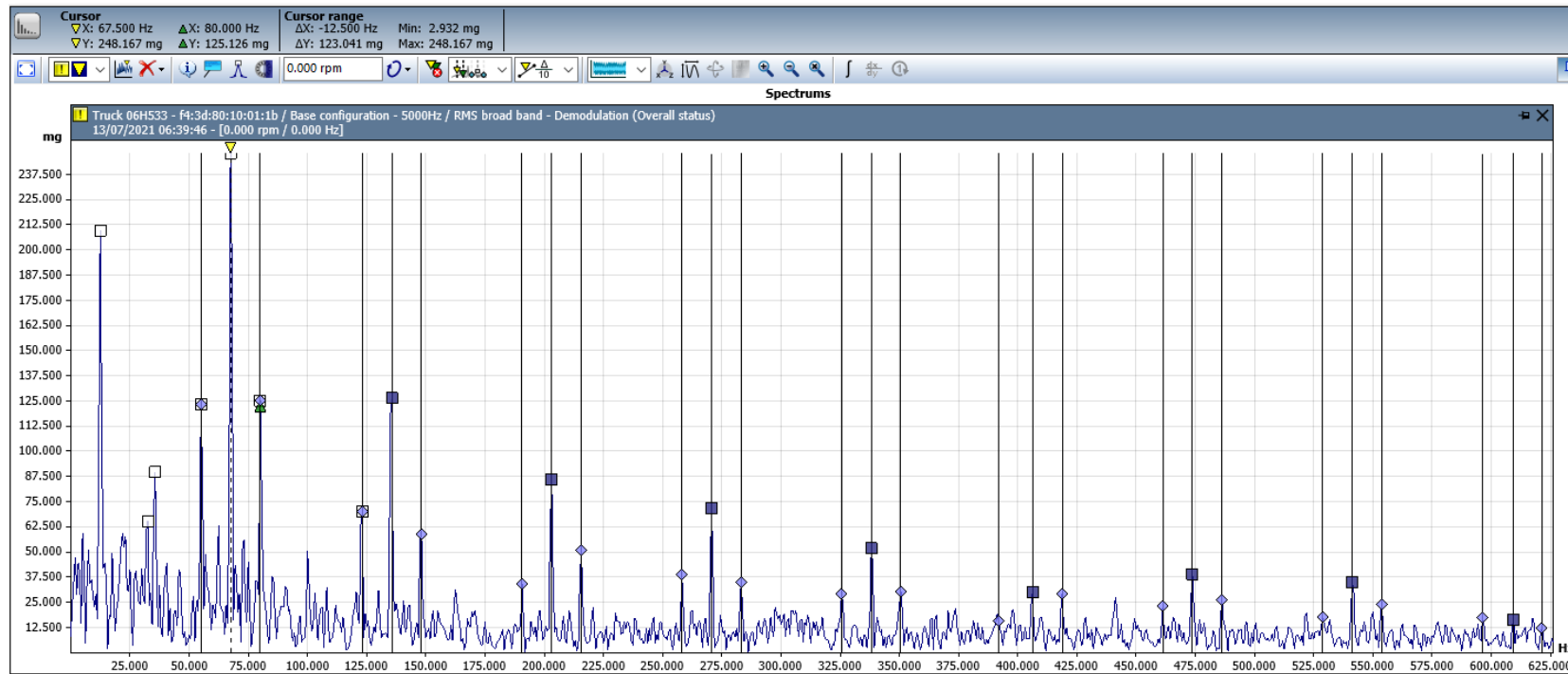SmartUtility light can be downloaded from Schaeffler Homepage for free

Administration of SmartCheck and ProLink devices

- Free of charge on Schaeffler Homepage

- Administration of Device settings

- Download of data from the device

- Update of device Firmware

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SmartUtility Software

EP1 Number	EP1 Designation	Designation
075514389-0000-10	SMART.UTILITY	Smart Utility Software The SmartUtility offers the following functionalities: - Search of SmartCheck/ProLink within the network - Administration of the SmartCheck/ProLink - Download of measuring data - Diagnosis and analysis of measuring data - Update of firmware - Setting of network parameters

Tool to analyze data of SmartCheck and ProLink Daten

- Download and send of device configuration

- Import of measured data which were send via E-Mail

- Analyzis of measured data of SmartCheck and ProLink

- Report generator

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1   Technical Details

2   Accessories & Material Numbers

3   **Trainings**

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Training 1: Introductory product training

- Schaeffler SmartCheck and ProLink with SmartUtility
  Introductory product training
    - Installation and Commissioning of the SmartCheck and ProLink CMS
    - Overview of the core functions of the SmartCheck and ProLink CMS
    - Working with the standard configuration
    - First inspection of the measured data
    - Learning phase, alarm thresholds and alarms
    - Download of measured data
    - Exercises

Duration: 1 Day

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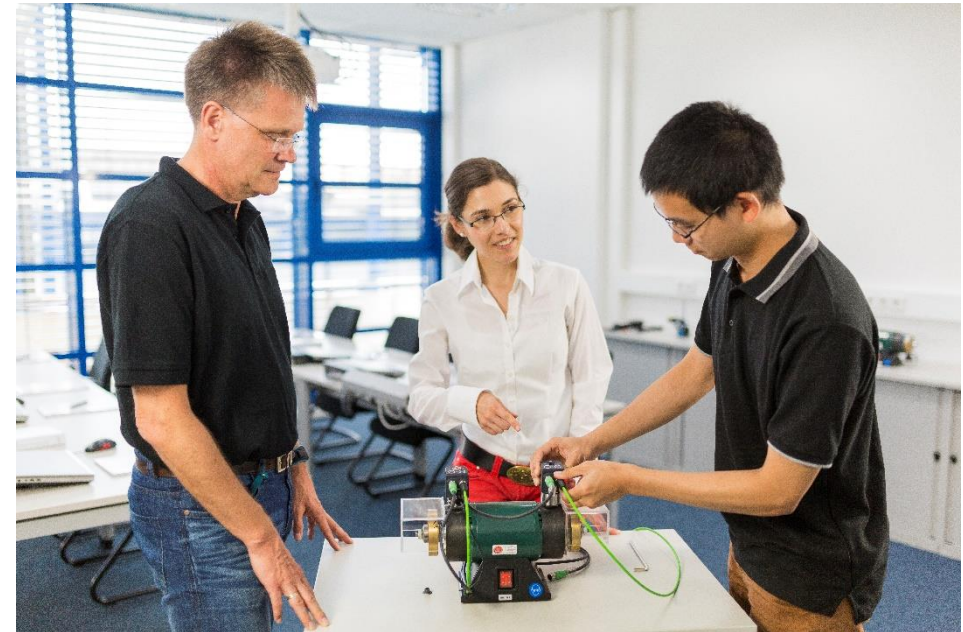
Training 2: Advanced product Training

- Schaeffler SmartCheck and ProLink with SmartUtility Advanced product Training
  - Basic vibration theory
  - Basic signal processing
  - Machine vibration
  - Condition monitoring
  - Vibration measurement with SmartCheck and
    - ProLink CMS on machines with constant an variable speed
  - Analysis and assessment of vibration measurements
  - Exercises

Duration: 3 Days