

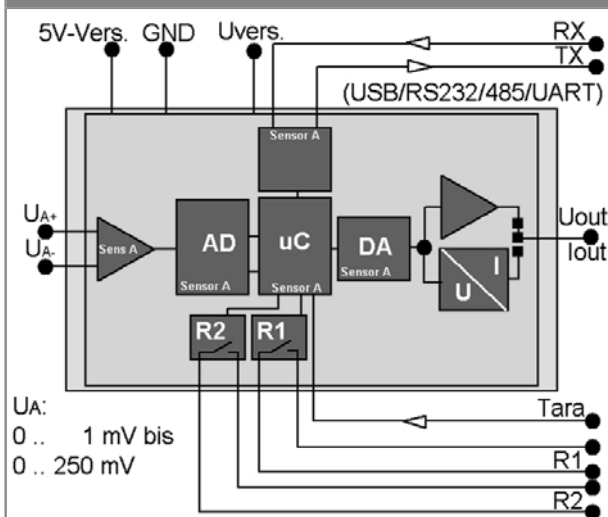
## EMA3-1DMS / EMA3-2DMS - External Sensorelectronic

- 24 V Power supply
- Direct connection up to 2 strain gage sensors
- Output signal digital: Sensor A, B and result
- Output signal analogue: Sensor A or result
- Standardized output signals (0... 5/10V, 0/4 ... 20mA)
- Digital Interface: USB, RS232, RS485, UART
- Semiautomatic calibration via software, software und interface-cable are included in delivery (Set)
- System adjustment (EMA3 and DMS-sensor) according customer request
- Installation on DIN EN mounting rail
- Various add on features

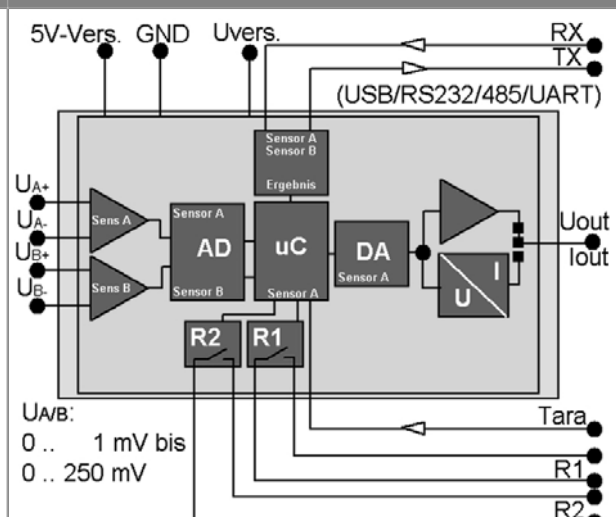


The EMA3-DMS module do the complete signalconditioning of one or two strain gage sensors. Power supply of the sensorelement (Wheatstone Bridge) is normally 5 V. The most important outputsignals 0..5V, 0..10V; 0..20mA; 4..20mA are available. Sandard digital signals are available as UART, RS232, USB interfaces. The electronic unit is placed in a mounting rail (Phönix UEGM) housing. The calibration of nominal and zero signal take place by software. Input and output pins are protected against ESD and overvoltage

Schematic EMA3 – DMS

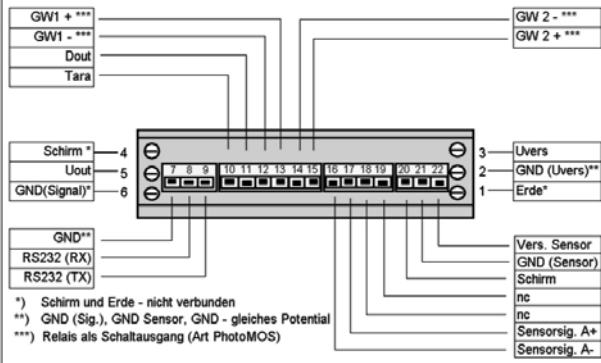


Schematic EMA3 – 2 DMS

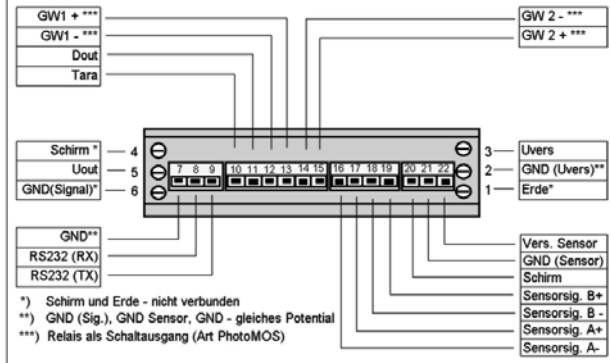


# EMA3-1DMS / EMA3-2DMS - External Sensorelectronic

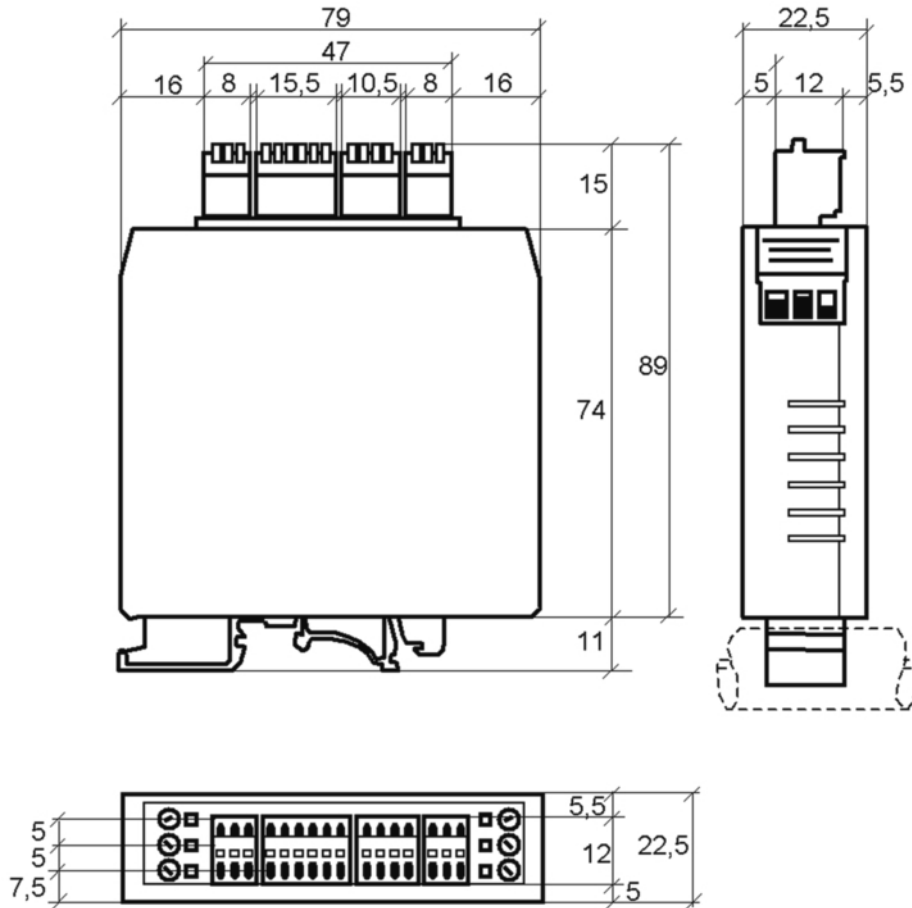
## Pinout EMA3 – DMS



## Pinout EMA3 – 2 DMS



## Dimensions



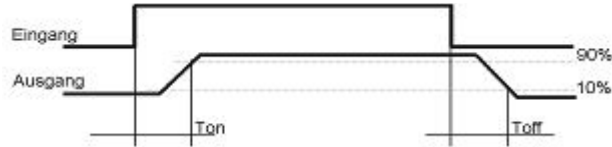
## Technical Data

Parameter	Min	Typ	Max	Unit
Supply voltage	16	24	30	V
Current consumption	12	20	45	mA
Protection against reverse polarity versus U <sub>supply</sub> versus U <sub>out</sub> / I <sub>out</sub>			35	V
<b>Environmental condition</b>				
Operating temperature	-25		85	° C
Storage temperature	-55		125	° C
<b>Powersupply of sensorelement</b>				
Supply voltage sensor		5		V
<b>Input signal</b>				
Differential voltage input	1	10	250	mV
Input resistor		180		kOhm
<b>Resolution</b>				
Resolution (frontend)			16	Bit
Resolution backend analog			16	Bit
<b>Output signal</b>				
Accuracy calibration		0.1	0.15	% F.S.
Nonlinearity (electronic)			30	ppm
<b>Output signal analog voltage</b>				
Output range	1		12	V
Offset range	0		10	V
Temperature coefficient zerosignal (electronic)			100	ppm/K
Load resistor (voltage output)	2			kOhm
Output current limitation	5	7	10	mA
Load capacitive	0		500	nF
<b>Output signal analog current</b>				
Output range	1		22	mA
Offset range	0		10	mA
Temperature coefficient zerosignal (electronic)			150	ppm/K
Shunt (current output)	100		500	Ohm
internal resistor (current output)	0.5	1		MOhm
Load capacitance	0		500	nF
<b>Output signal digital USB, RS232, RS485, UART</b>				
Output range	-4.5		4.5	display
Temperature coefficient (electronic)			50	ppm/K
Refresh time (with function)			200	Hz
Refresh time (without function)			300	Hz
<b>Limit Switch 1 and 2</b>				
Switching voltage			5	V
Switching current			5	mA
peak load current			10	mA
power dissipation			10	mW
I/O Isolation voltage			1500	V AC
response time (Ton)			0.2	ms

# EMA3-1DMS / EMA3-2DMS - External Sensorelectronic

falltime (Toff)			0.2	ms
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## Order Description

Type	Input Signal	Power Supply	Output Signal analogue	Function (pls. see legend below)
EMA3	1 DMS 2 DMS	24	05 10 20 42	F001-00 F002-00 ... F201-00 <b>F202-00</b> ...

**Example: EMA3 2DMS 24 10 F202-00** (Standard version bold)

Adjustment and activation of the assembly requires a programming cable, RS232-USB converter and software. Available as a complete set or individually (see below). Please order separately.

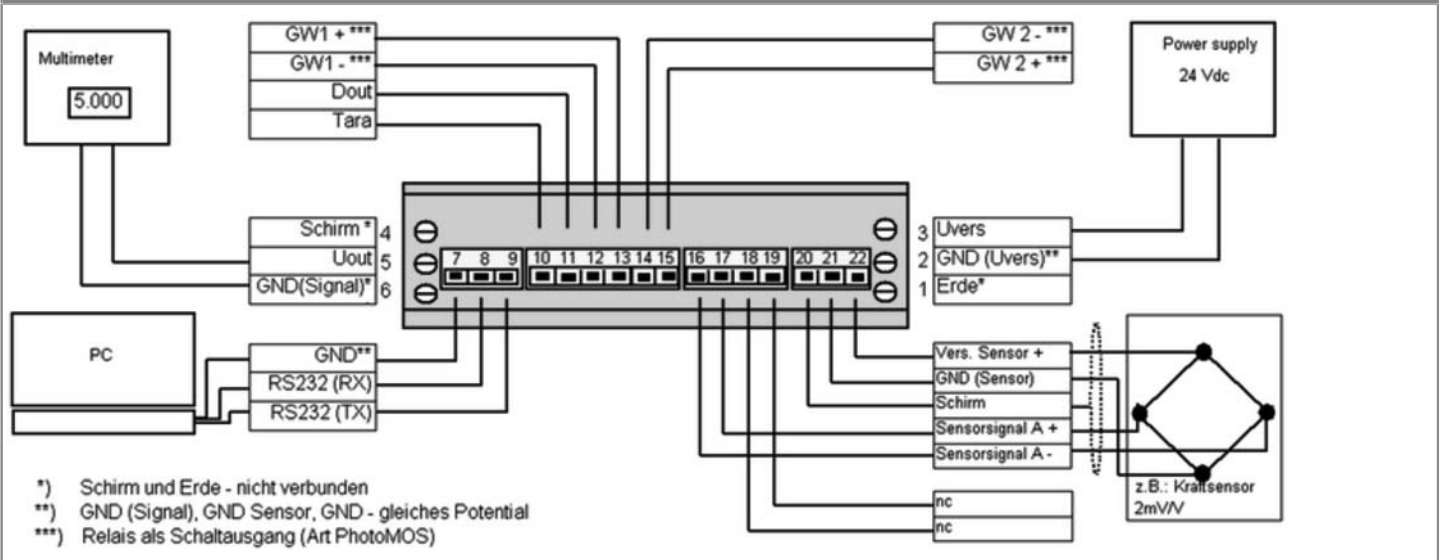
### Accessories (available as a complete set or individually, please order separately)

Interface cable: DATENKABEL FÜR EMA3	Part. No. 700319	included in EMA-SET Part No. 700428
USB-converter: RS232-USB	Part. No. 700336	
Software: CalTool	Part. No. 700379	
Software: CalTool Profi	Part. No. 700335	individually

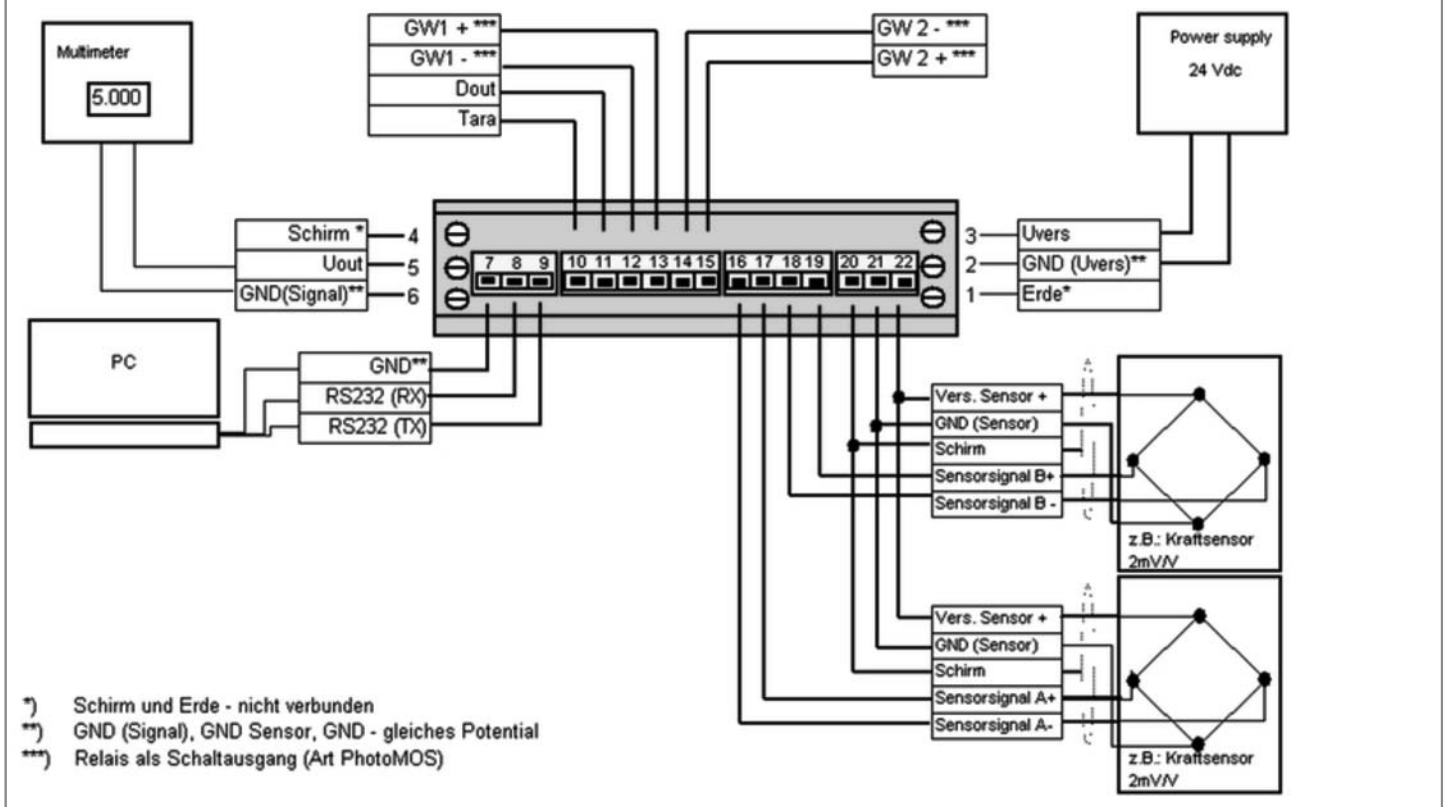
## Legend

EMA3	- External electronic in DIN EN mounting rail	<b>Single Functions</b>	
DMS	- for one/two DMS sensors	F001-00	- Tare
24	- 24 V Supply	F002-00	- Limits
5	- 0..5 V Signal Output	F003-00	- RS232 Interface
		F004-00	- RS485 Interface (optional)
10	- 0..10 V Signal Output	F005-00	- USB Interface (optional)
20	- 0..20 mA Signal Output	F006-00	- UART Interface (optional)
42	- 4..20 mA Signal Output	F007-00	- Drag Pointer (optional)
		F008-00	- Zooming (optional)
		F009-00	- Status Indication (optional)
		F010-00	- Summation (optional)
		F011-00	- Condition Detection (optional)
		F012-00	- Cable Break Detection (optional)
		F013-00	- Display (optional)
		F014-00	- Matrix Printer (optional)
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		<b>Combination of Functions</b>	
		F201-00	- Tare + Limits
		F202-00	- Tare + Limits + RS232
		F203-00	- Tare + Limits + RS485
		F204-00	- Tare + Limits + RS232 + USB
		F205-00	- Tare + Limits + UART
		F206-00	- RS232 + USB
		<b>00 Parameter Setting:</b>	
			Definition of Tare Values at $\pm 20\%$ FS
			Definition of Limits 1 = 60%FS; Limit 2 = 80%

## Wiring Example EMA 3 – DMS



## Wiring Example EMA 3 – 2 DMS

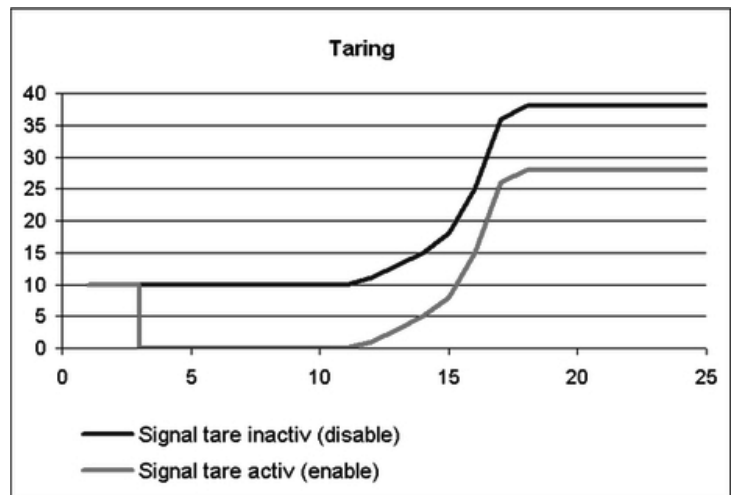


The specifications and information in this datasheet cannot consider all special demands that are caused by the application. Because of this, they are no general description of the properties of the product.

01. February 2011. All specifications are subject to change without notice.

## Function 001: Tare

Via taring the outputsignal (digital and analog) will be set to zero. For example: Zero signal of the sensor is 0 kg. The sensor is loaded with a basic load. The output signal shows the basic load. When we tare the sensor the output signal goes to 0 kg. Taring is done when Pin 8 or cable strand red was connected to GND. If the offset signal deviate from 0. Taring base on the offset signal of calibration. For example: Zero signal of the sensor is 5 kg. The sensor is loaded with a basic load. The output signal shows 5 kg + basic load. When we tare the sensor the output signal goes to 5 kg.



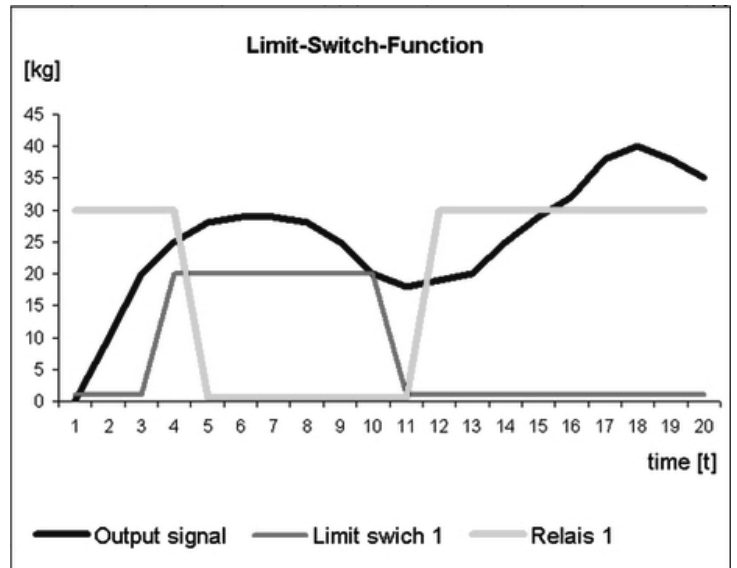
## Function 002: Limits (optional)

Limiting values show if a defined threshold passes over or falls below. As long as output signal stays below a fixed limiting value status shows low. As soon as it passes over status shows high. **Types:** Up to 2 limiting values could be fixed for each sensor. In addition it's possible to fix a switching hysteresis.

### Example:

Limiting value = 20kg Sensor is loaded with 15kg → condition = low

Limiting value = 20kg Sensor is loaded with 25kg → condition = high



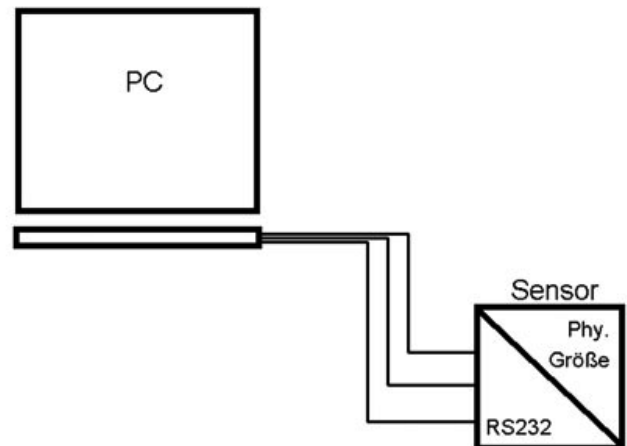
## Function 003: Digital Interface RS232

Integrated amplifier models could be also equipped with RS232 Interface.

Baudrate = 115,2 kBaud.

Standard protocol = bitoriented. ASCII could be realized.

Tip: On Baud rate of 115 kBaud the cable length must not be longer than 2 m.

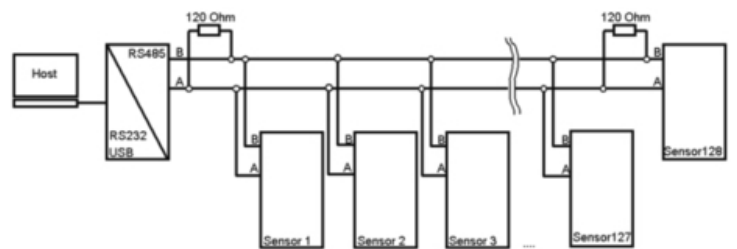


## Function 004: RS485 Interface

RS485 interface connects up to 128 sensors. Operation mode = half duplex.

Data transfer rate = 128kBaud (reducible).

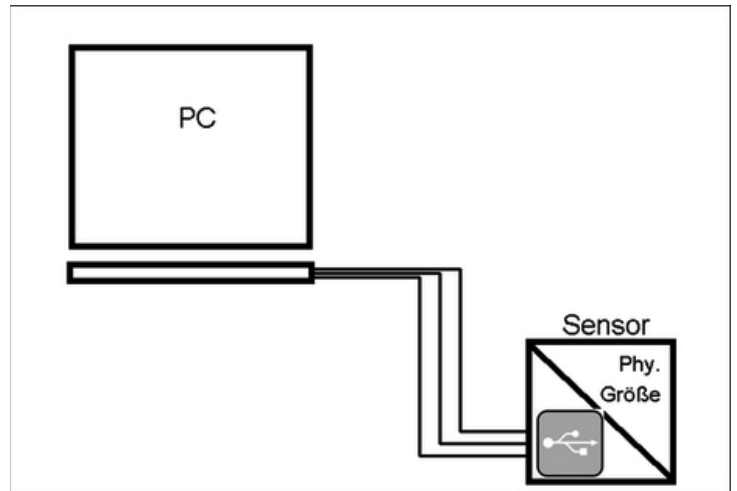
Value updating will be made every 5ms. It's a bitoriented disposable protocol.



## Function 005: USB Interface

Integrated amplifier converts physical value to digital signal (data transfer rate = 115 kBaud).

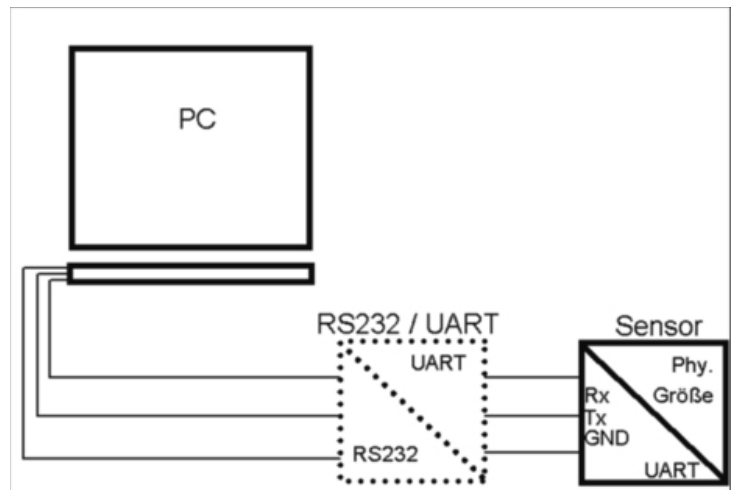
Signal transmission runs with USB Interface (USB standard 1.1.)



## Function 006: UART Interface

The intelligent electronic convert and calculate the analogue value of the sensor in a digital value and provides it on the UART interface. The read in of signal in computer will be done directly via adequate converter. The value of bit rate is 115kbit. The data transfer is bit orientated. One sensor value will be transferred in 4 bytes. Detailed description of the protocol is written in [www.megatron.eu](http://www.megatron.eu).

Note: Length of data cable may not longer than 30 cm.



## Function 007: Drag Pointer (optional)

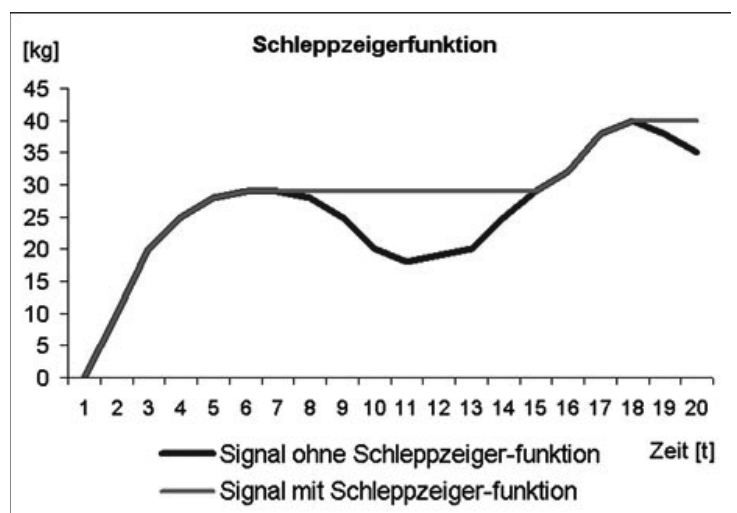
Output signal (digital or analog) could be shown as drag pointer. I.e. as long as the sensor signal increases, output signal increases in the same way. But as soon as the sensor signals decreases, output signal will be fixed at the highest value.

### Types:

Drag pointer switched on constantly? Yes / no

Drag pointer switched on at sensor signal xxxx

**Reset:** A defined wire has to be connected with ground (GND)





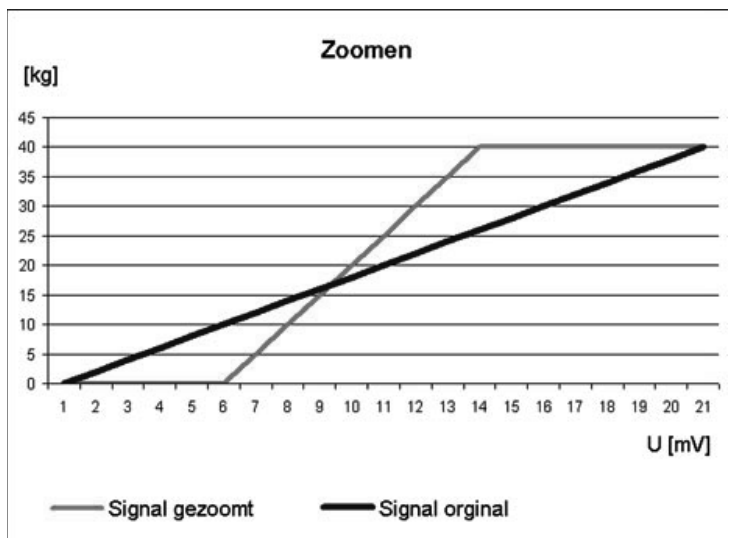
## Function 008: Zoom (optional)

With zoom function it's possible to focus on a defined partial range of total measuring range.

### Types:

Before zooming area: output signal will be 0 or a custom defined value

Beyond zooming area: output signal will be fullscale or a custom defined value



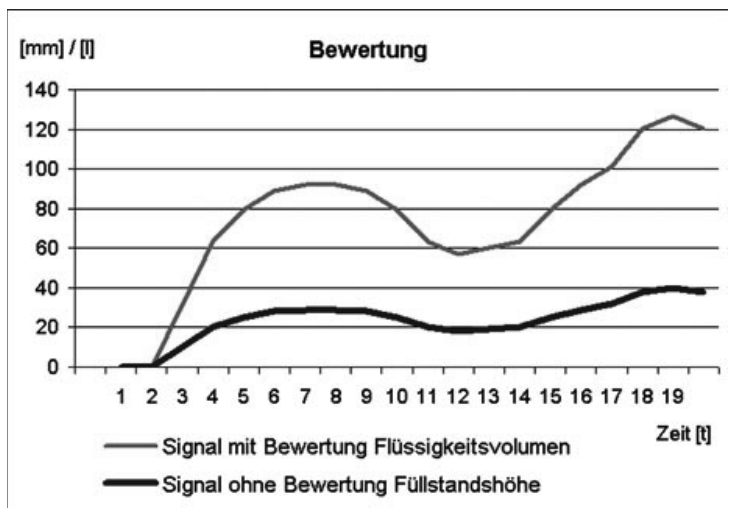
## Function 009: Characteristic Curve Rating (optional)

Output signal (digital or analog) is rated, which means an arithmetic operation effects the sensor signal. In general all basic arithmetic operations (addition, subtraction, multiplication or division) are possible, as well as combinations.

### Examples:

Signal without rating = force in N

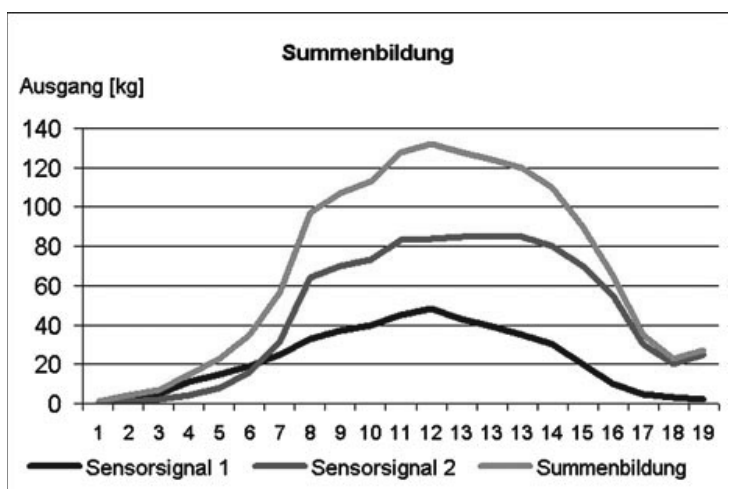
Signal with rating = torque in Nm  
(force x torsion arm)



## Function 010: Summation (optional)

The electronic numerate up to 4 sensorsignals as a sum result. Each sensor can be calibrate separately. The calibrated sensorsignals adds up to one result. The result is available as analogue and digital output signal. Other combination are possible. Following mathematical combinations are contingent:

- Summation
- Subtractions
- Multiplications

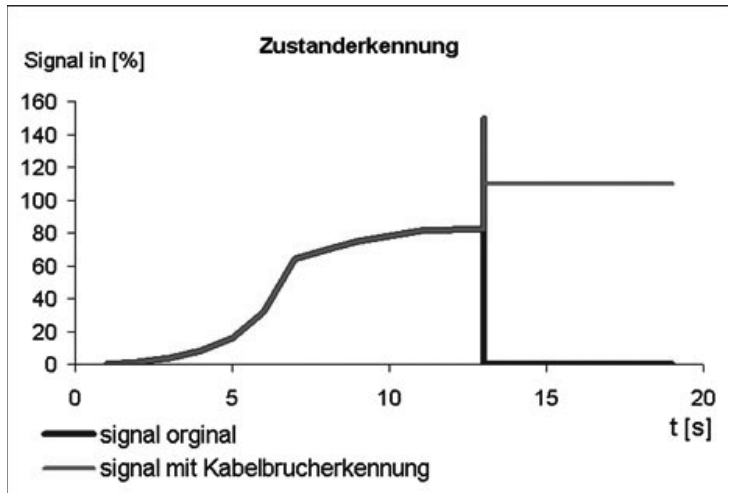


**Function 011: Status Indication (optional)**

Customised defined parameter could be shown or stored.

**Examples:**

- Sensor overload
- a) digital (additional display required): "overload" is monitored
- b) analog: output signal increases to 110% and stays there constantly
- c) defined I/O-wire: low à high
- indicating overload value (e.g. 110%, 130%, 150%) à is there a constant deformation
- counting how often 100% load was applied
- counting numbers of load cycles (life time)
- remaining life time

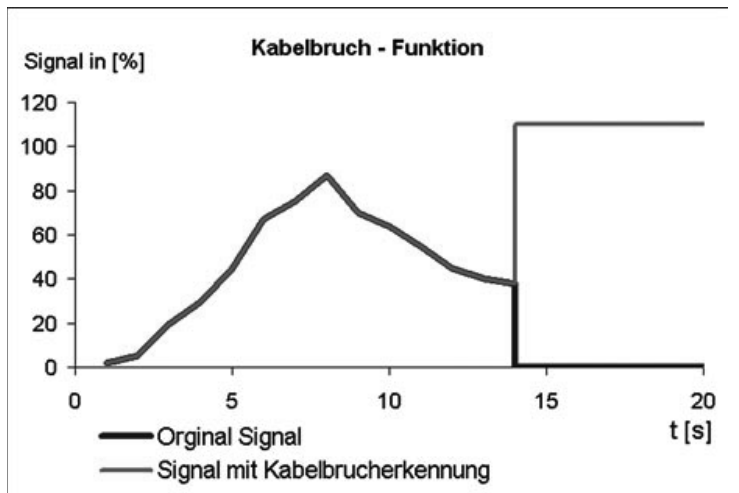


**Function 012: Cable Break Detection (optional)**

This function checks internal sensor wiring as well as the cable itself (supply- and signal-wires) for breaks. A break will be indicated within 5ms.

**Types:**

- a) digital (additional display required): "break" is monitored
- b) analog: output signal increases to 110% and stays there constantly
- c) defined I/O-wire: low à high



**Function 013: Display (optional)**

The digital value of the sensorsignal can be displayed on a 2 rows - 8 characters display. The value will be transmit as standard ASCII format with a bit rate of 9600 baud (bit/sec.) The result will be displayed with 4 ½ digits. the value of the signal will be displayed in the first row. The physical unit will be displayed in the second row. Customizing is possible.

**Displayfunktion**



## Function 014: Matrix Printer (optional)

The digital value of the sensorsignal can be transferred as print out to a dot matrix printer of MEGATRON France or other ASCII compatible matrix printer. Values will be transmitted via RS232 interface. The print out is free configurable.

**Example:** predefined printout The printout will be started by a trigger impulse via push button.

First printout is a free defined header followed by date – time – sensor value in 4 ½ digits and physical value.

The Print out will be closed with a free defined footer. Each other flow of print out is possible.

**Druck-Funktion**

MegAsic GB der MEGATRON Elektronik AG&Co		
03-11-08		
12:51:57	0.28	kg
12:52:07	0.25	kg
12:52:17	0.28	kg
Hermann Oberth Str. 7 D- 85640 Putzbrunn - München Phone: +49.89.46094-270 Fax: +49.89.46094-223 e-mail: info@megasic.de		

- Kopfzeile - frei editierbar -
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Further functions are possible. Please contact us.