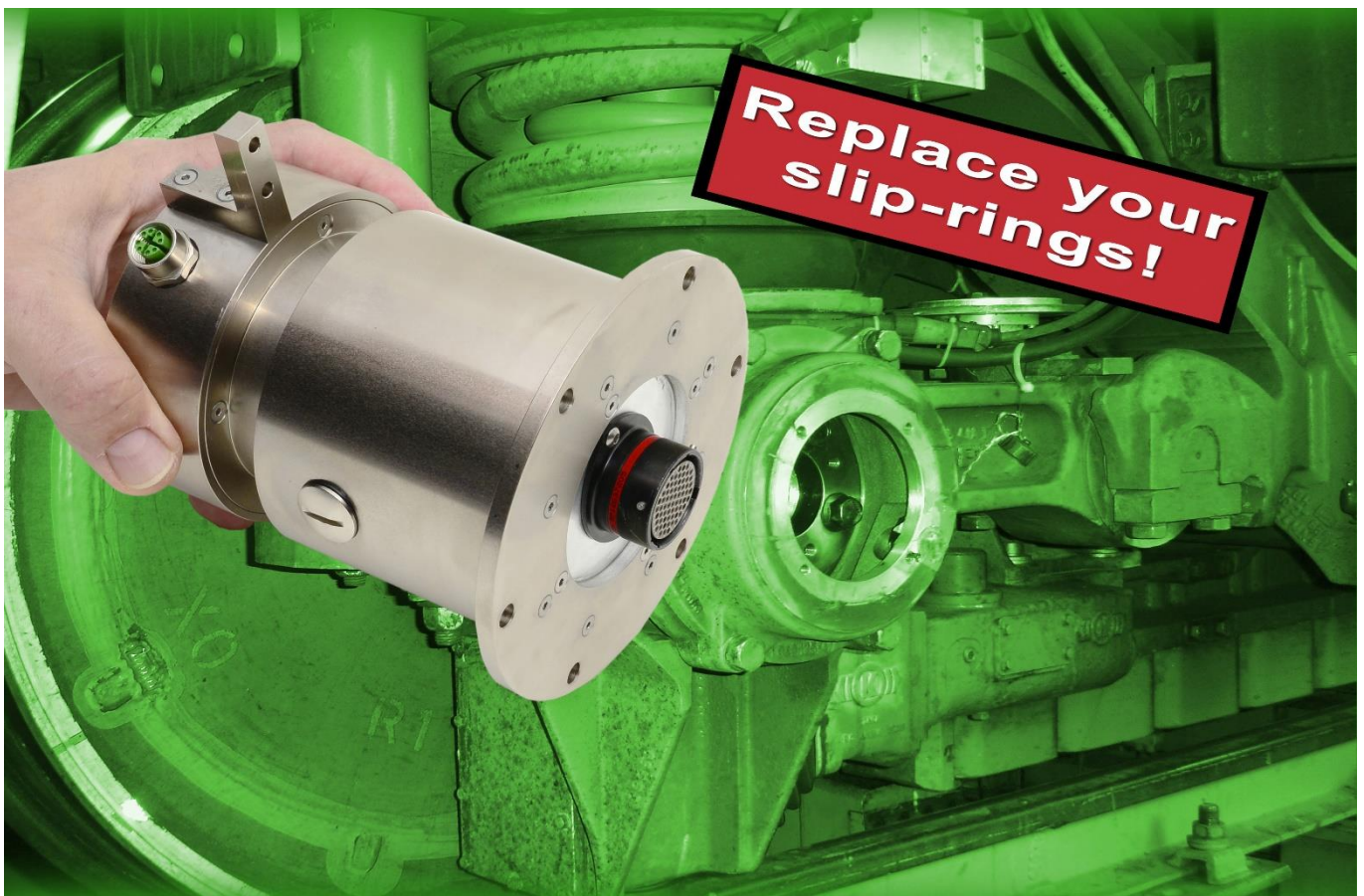


# R16-PCM-Rotate

**Fast, simple assembly and trouble free wireless data transmission with the new axial 16-channel 16bit telemetry system for strain gages**

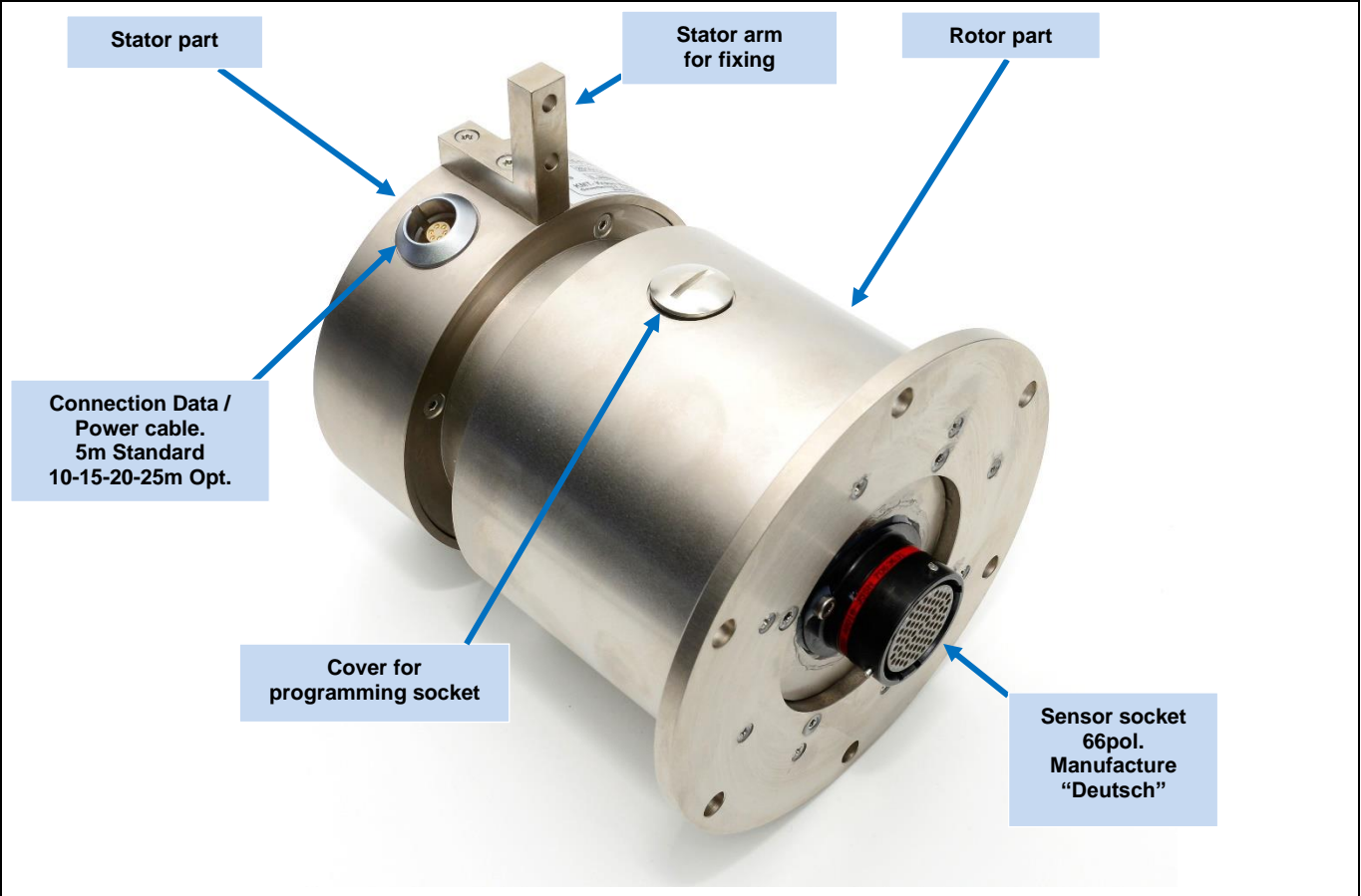
## User Manual



- Full- and half bridge
- Auto Zero Offset calibration
- 4V bridge Excitation
- 16 bit resolution
- Simultaneous sampling
- Transmitting rate 5Mbit
- Signal bandwidth: 16x 0-6000Hz
- Software programmable!
- Gain 125-250-500-1000-2000
- Inductive power transfer
- Wireless digital data transmission
- Output analog +/- 10V
- Digital data interface to PC (option)
- Waterproofed housing (IP65)

**INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!**

## R16-PCM-Rotate - General description:



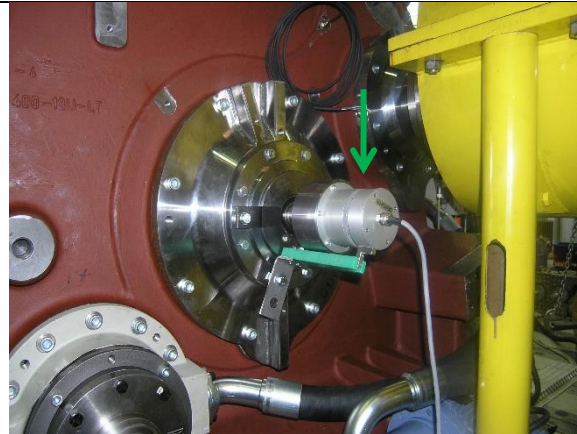
The new R16-PCM is a rugged, waterproof axial unit for collecting dynamic measurements from rotating devices under shock and vibration loads like railway wheels, gear boxes, test rigs or other axial applications. It enables conditioning, digitization and wireless transmission of up to 16 parallel strain gage (STG) signals. Signal and power transfer is contactless, data being transmitted optically and power inductively. No batteries and no routine maintenance! The fully sealed environmental housing and extended operating temperature range make it particularly suitable for off-road and winter testing in arduous conditions.

On the rotating side the strain gage signals are conditioned and amplified. The analog strain gage signals are converted into a 16 bit digital format. Data transmission from the rotating to the stationary side is achieved by an infrared telemetry link along the centerline of the axis for a serial bit stream. The power for the rotating amplifiers sensor excitation and signal conditioning is supplied via induction. This ensures uninterrupted continuous power supply. The rotating strain gage amplifiers are software programmable via web interface. The settings are gain, auto-zero and type of strain gauge.

On the stationary side the digital output is connected to the decoder unit via a standard data cable. The decoder unit converts and de-multiplexes the serial bit stream into a parallel format. This parallel signal along with address and clock information is converted to 16 each analog signals (+/-10V) and made available on a Sub-D connector on the decoder unit. Optional is an IP-LAN interface for digital transfer of data's into the PC available.



Railway wheels



Gear box

## R16-PCM-Rotate - Technical Data:



NEW version 2015



Front side



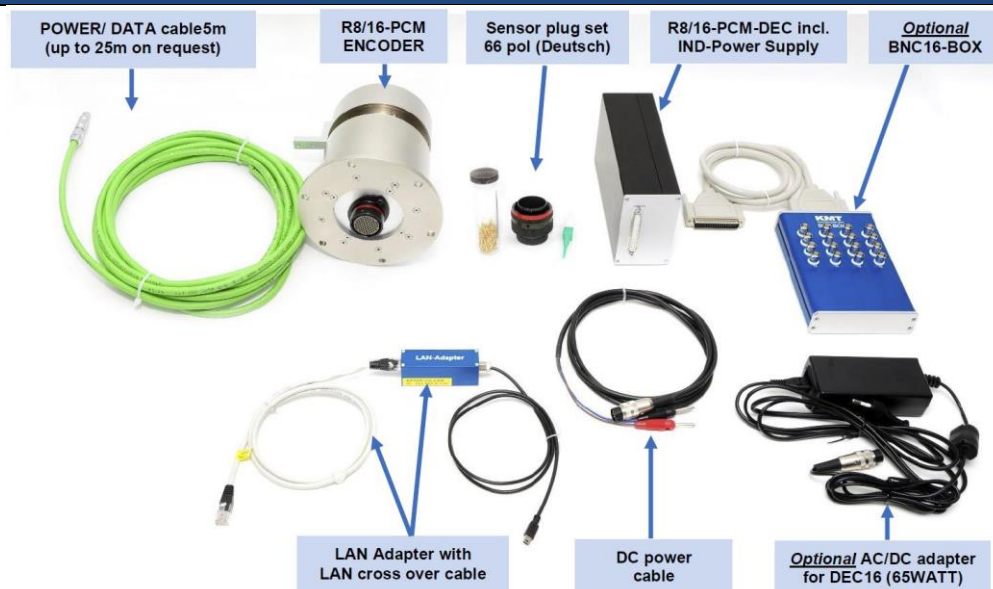
Rear side

### Encoder (Rotor Electronic)

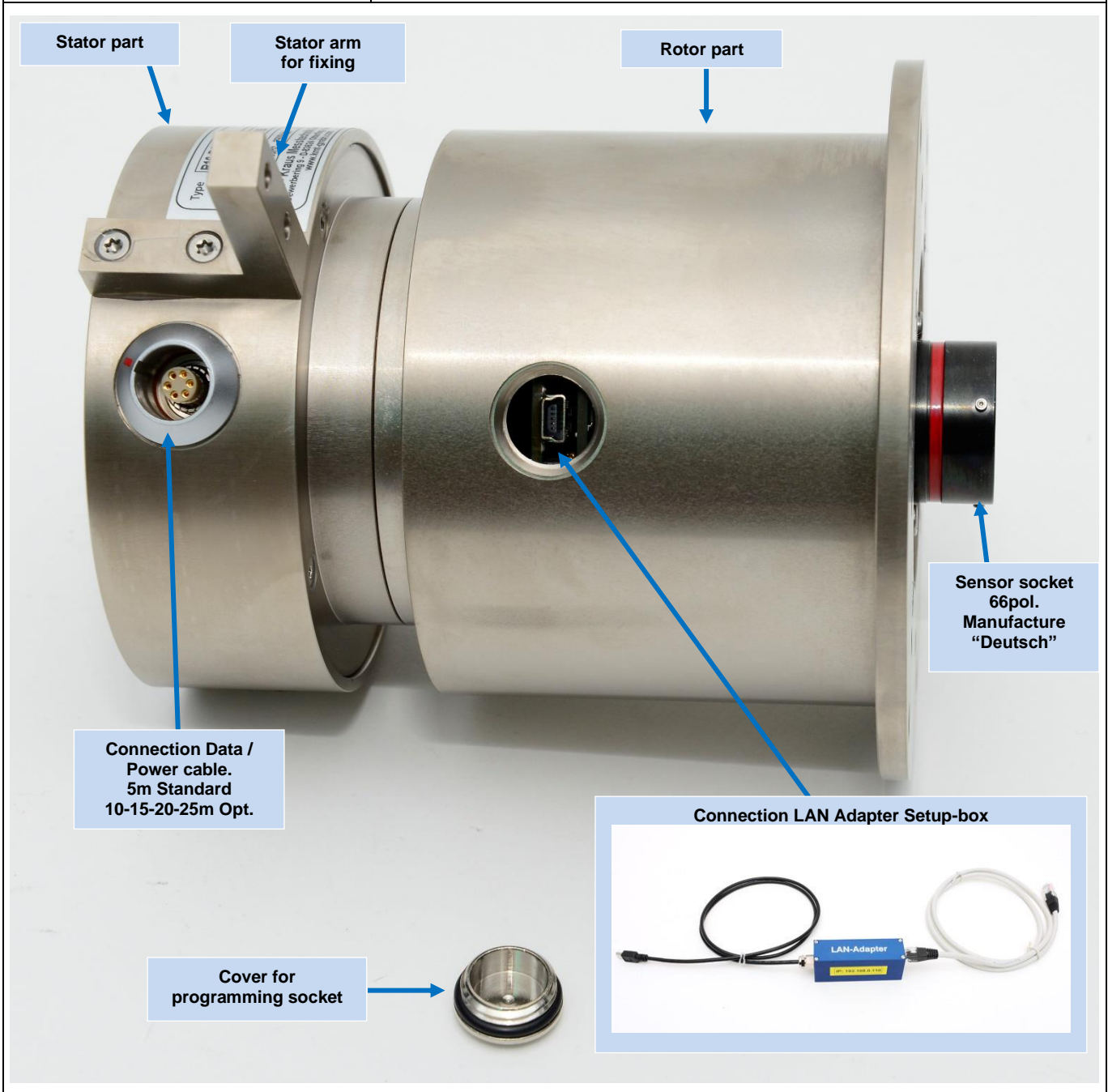
### Decoder / IND-PWR

Number of channels:	16	Number of channels:	16
Sensor support	Strain gages full and half bridge $\geq 350\Omega$	Analog Output	+/-10V via 37-Sub-D connector
Excitation	4V for all channels	Digital Output	PCM serial (optional IP-LAN interface for PC)
Gain	125-250-500-1000-2000 (selectable by software)		
Offset calibration	Automatically (Auto Zero)		
Anti-aliasing filter	5-pole Butterworth and 2-stages digital down sampling filter		
Band width	6000 Hz per channel	Band width	6000 Hz per channel
Sampling rate	15625 Hz per channel	Delay between IN/OUT	<b>5.980 ms</b>
Resolution	16 bit ADC	DAC (digital to analog converting)	16 bit
Powering	Inductive	Powering	10-30V, ~ 50 Watt (e.g. 24V 2A)
Data transmission	PCM digital infrared link	Data receiving	PCM
Operating temperatures	-30 ... 80°C	Operating temperatures	-20 ... 70°C
RPM	Max. 3600		
Dimensions	100 diameter, 136 Lengths (mm)	Dimensions	205 x 105 x 120 (mm)
Weight	1450 gram	Weight	1050 gram
Housing protection type	IP65	Housing protection type	IP54
Housing material	Aluminum anodized	Housing material	Aluminum anodized
Humidity	20...100%	Humidity	20 ... 80% (not condensing)
Shock	1000g	Shock	100g
Vibration	+/- 10g	Vibration	5g
Power/Data cable	Length up to 25m, <b>5m is standard</b> (between Encoder /Decoder)	System accuracy	$\pm 0.25\%$ (without sensor)

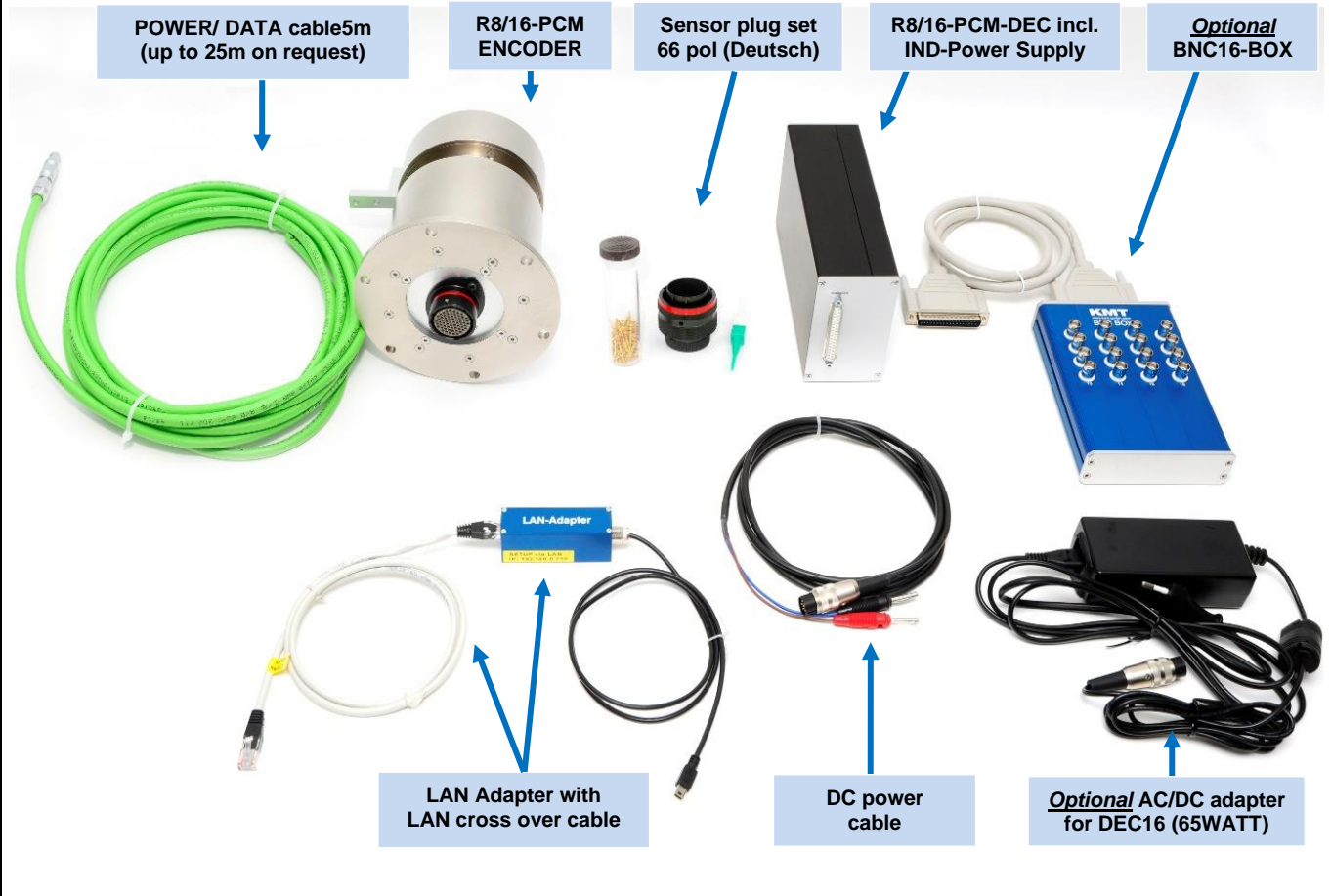
### SET and cable connection of R8/16-PCM-Rotate



Settings	Programmable via web interface																																
<p>Web interface address: <b>e.g. IP 192.168.0.110</b> (see nameplate about IP)</p> <p><u>Settings:</u> Gain 125-250-500-1000-2000 Half- and full bridge Make Auto Zero YES/NO</p> <p><b>Selectable for each channel!</b></p>	<h3 style="text-align: center;">KMT R8-PCM Analog Channel Setup</h3> <table border="0"> <tr> <td>Channel 1 Gain: <input type="text" value="125"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 1</td> </tr> <tr> <td>Channel 2 Gain: <input type="text" value="2000"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 2</td> </tr> <tr> <td>Channel 3 Gain: <input type="text" value="1000"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 3</td> </tr> <tr> <td>Channel 4 Gain: <input type="text" value="500"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 4</td> </tr> <tr> <td>Channel 5 Gain: <input type="text" value="250"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 5</td> </tr> <tr> <td>Channel 6 Gain: <input type="text" value="125"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 6</td> </tr> <tr> <td>Channel 7 Gain: <input type="text" value="125"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 7</td> </tr> <tr> <td>Channel 8 Gain: <input type="text" value="125"/></td> <td>Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/></td> <td>Make Autozero: <input type="checkbox"/></td> <td>Channel 8</td> </tr> </table> <p style="text-align: right;"><b>*** Parameters saved ***</b></p> <p style="text-align: center;"> <input type="button" value="Upload Parameters to R8-PCM and perform Autozero"/> </p> <p style="text-align: center;"> <input type="button" value="Download Parameters from R8-PCM"/> </p>	Channel 1 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 1	Channel 2 Gain: <input type="text" value="2000"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 2	Channel 3 Gain: <input type="text" value="1000"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 3	Channel 4 Gain: <input type="text" value="500"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 4	Channel 5 Gain: <input type="text" value="250"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 5	Channel 6 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 6	Channel 7 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 7	Channel 8 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 8
Channel 1 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 1																														
Channel 2 Gain: <input type="text" value="2000"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 2																														
Channel 3 Gain: <input type="text" value="1000"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 3																														
Channel 4 Gain: <input type="text" value="500"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 4																														
Channel 5 Gain: <input type="text" value="250"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 5																														
Channel 6 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 6																														
Channel 7 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 7																														
Channel 8 Gain: <input type="text" value="125"/>	Type of Strain Gauge: <input type="text" value="HALF-BRIDGE"/>	Make Autozero: <input type="checkbox"/>	Channel 8																														



# SET of R8/16-PCM-Rotate



# R16-PCM-DEC Receiver unit for 16 Channels output via 37 pol. Sub D incl. inductive power generator

## Front side view

Female 37 pole Sub-D for analog signal output, CH 1 to 16

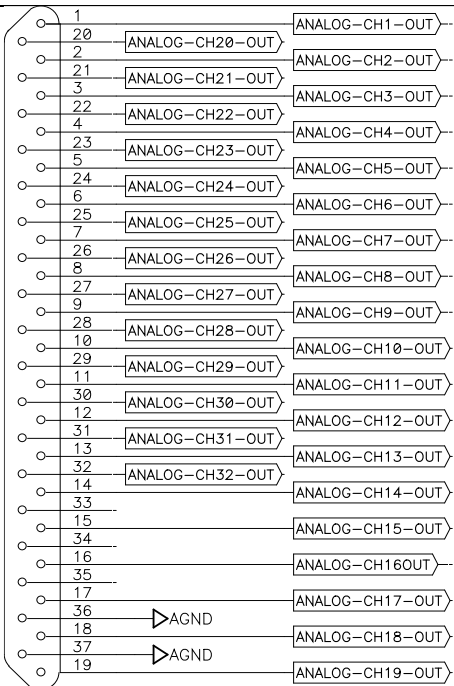
## Rear side view

Power Switch

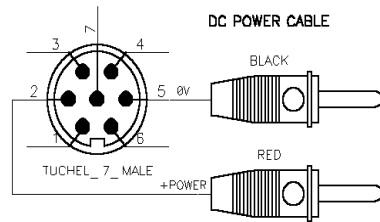
Transmission error LED  
Fuse of powering defect LED

7-pole female TUCHEL connector for power supply input (10-30V DC)

To ENCODER (Data IN, IND-PWR OUT)



Plug-side



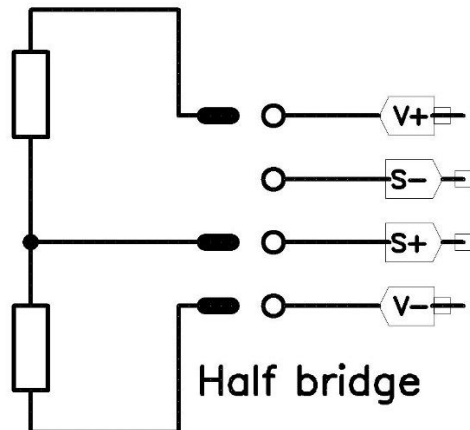
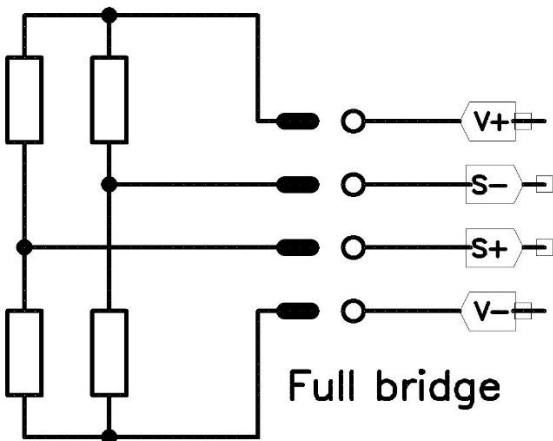
Optional BNC16 Box. Connect on 37pol Sub-D



## Sensor connection of R8/16-PCM-ENC

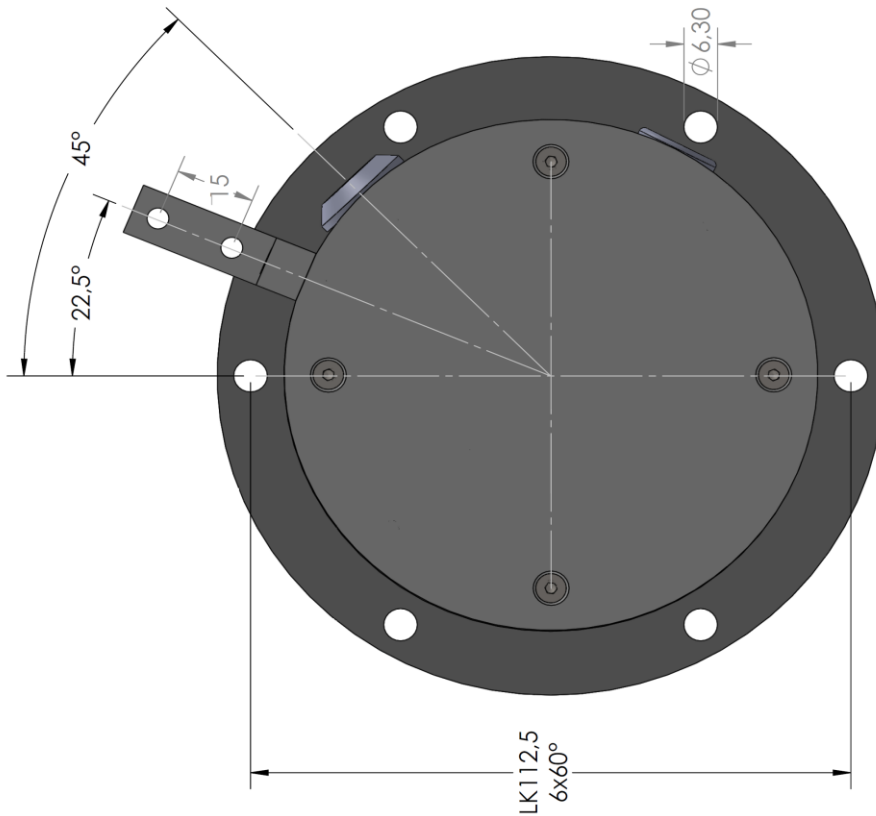
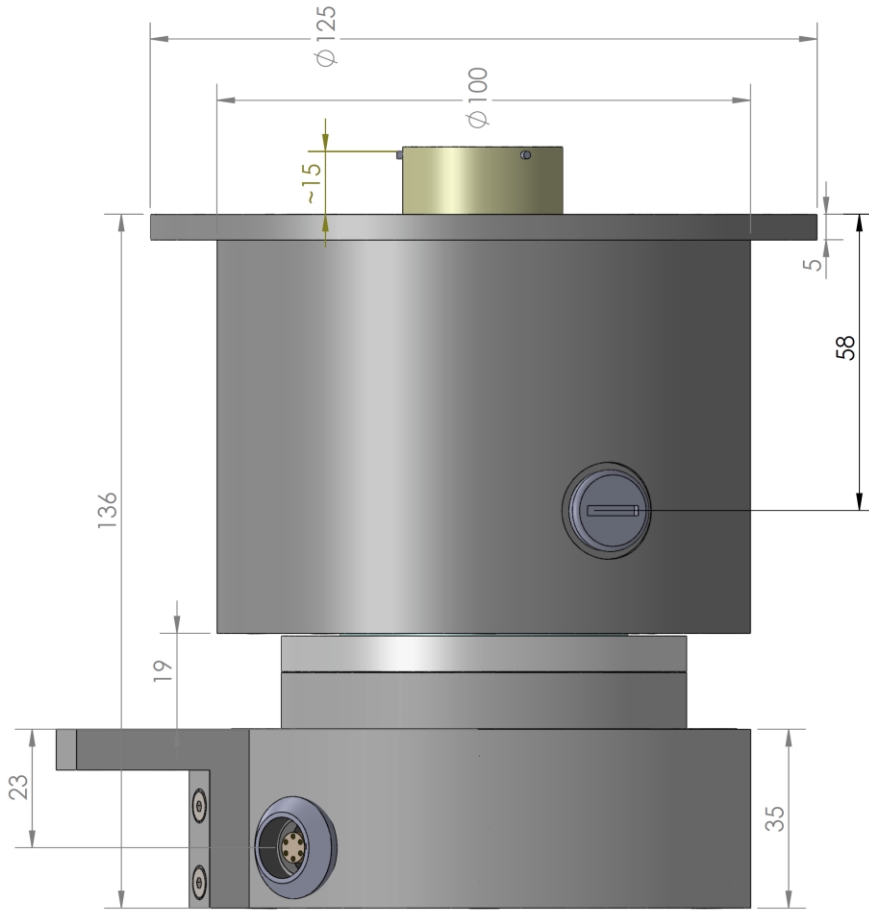
Pin	Signal	Channel
1	V+	CH1
2	V-	
3	S+	
4	S-	
5	V+	CH2
6	V-	
7	S+	
8	S-	
9	V+	CH3
10	V-	
11	S+	
12	S-	
13	V+	CH4
14	V-	
15	S+	
16	S-	
17	V+	CH5
18	V-	
19	S+	
20	S-	
21	V+	CH6
22	V-	
23	S+	
24	S-	
25	V+	CH7
26	V-	
27	S+	
28	S-	
29	V+	CH8
30	V-	
31	S+	
32	S-	

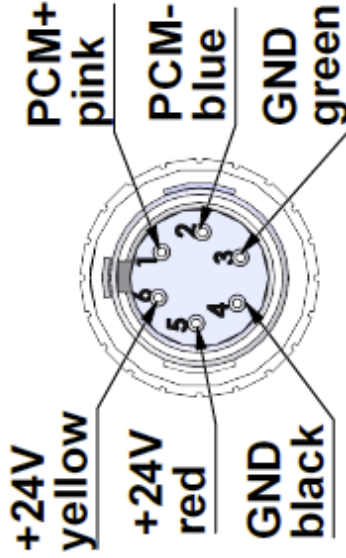
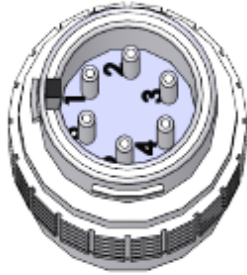
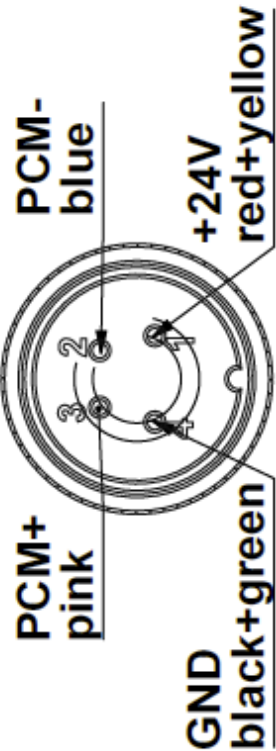
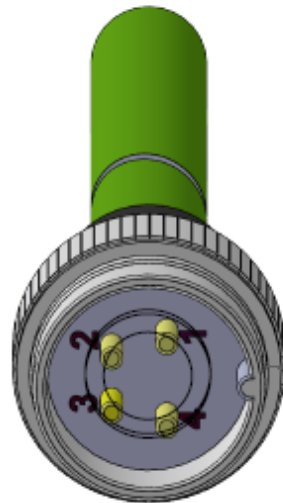
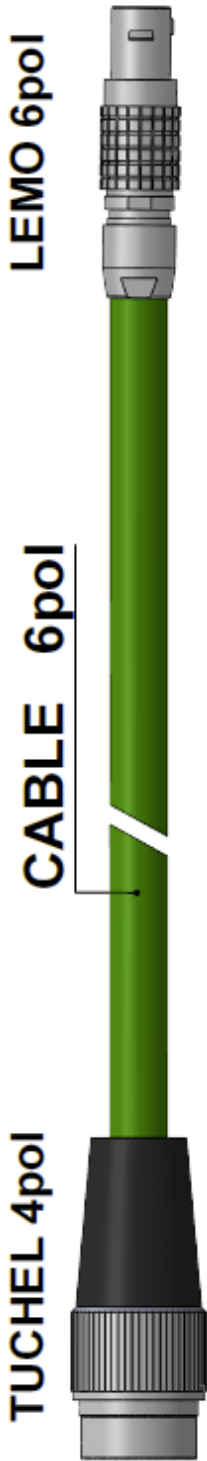
Pin	Signal	Channel
33	V+	CH9
34	V-	
35	S+	
36	S-	
37	V+	CH10
38	V-	
39	S+	
40	S-	
41	V+	CH11
42	V-	
43	S+	
44	S-	
45	V+	CH12
46	V-	
47	S+	
48	S-	
49	V+	CH13
50	V-	
51	S+	
52	S-	
53	V+	CH14
54	V-	
55	S+	
56	S-	
57	V+	CH15
58	V-	
59	S+	
60	S-	
61	V+	CH16
62	V-	
63	S+	
64	S-	
65	Free	Ground
66	Free	Case





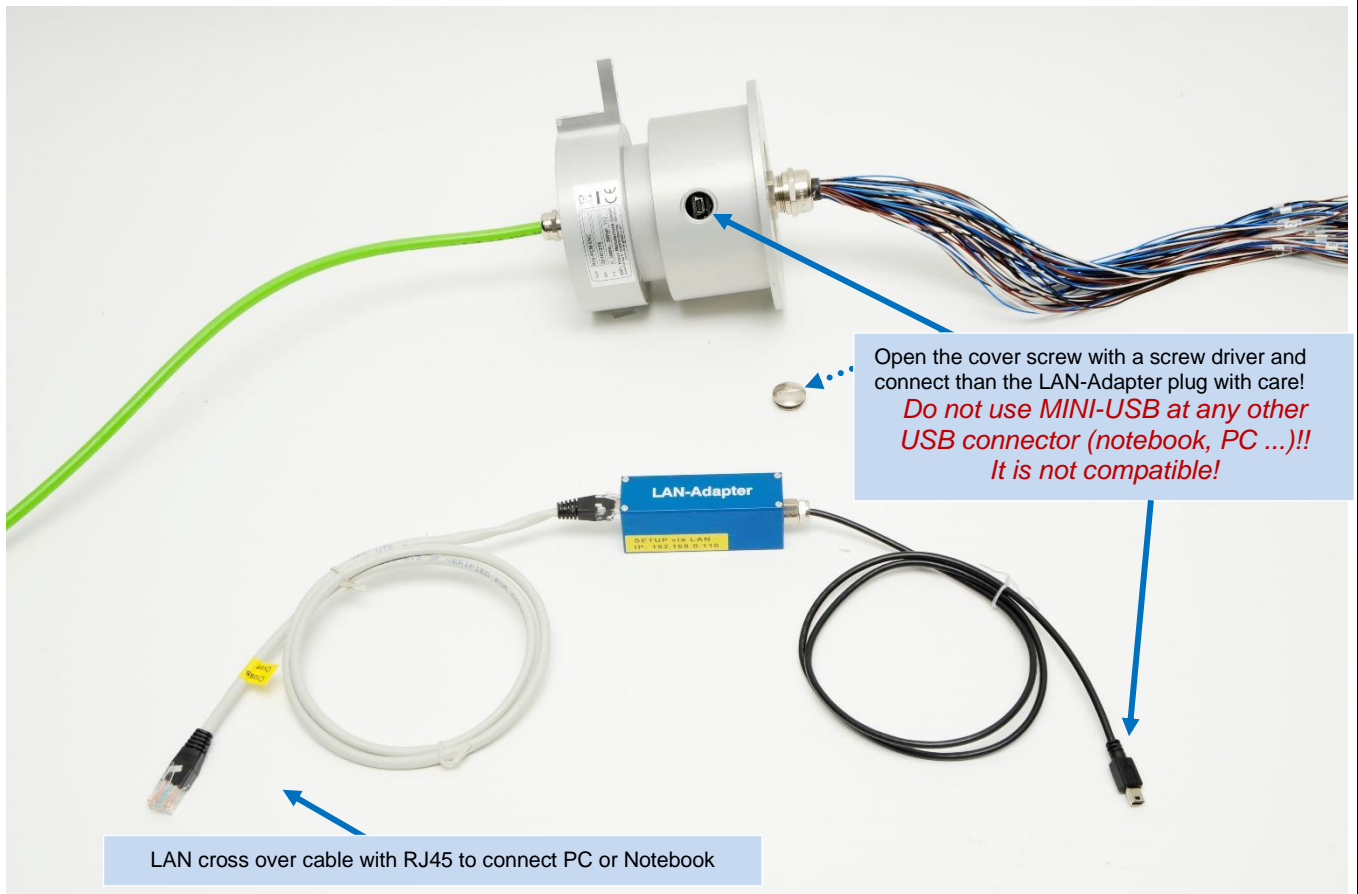
# Dimensions of R8/16-PCM-ENC






Date	Version	Mat:
29.04.2020		
Remarks:		
Bl : A4 Weight-gr: 2.57		
Scale		
1:1		
Part:		
TUCHEL-LEMO-Cable		
www.kmt-telemetry.com		
E-mail: info@kmt-telemetry.com		
Tel: +49 80 24-487 37 Fax: +49 80 24-6532		
<b>KMT</b>		hu
TELEMETRY		

## Settings of R8/16-PCM-ENC Programmable via web interface



Web interface address of LAN-Adapter = IP **192.168.0.110**

**Make sure, that's all sensor input cables before power on the R8/16-PCM-ENC are isolated or connected on strain gages or simulation board to avoid short cuts!!**

- 1) Power the R16-PCM-ENC with power
- 2) Connect the LAN-Adapter with the R8/16-PCM-ENC
- 3) Adjust your notebook to manual on e.g. IP 192.168.0.100
- 4) Connect LAN-Adapter with your notebook via cross-over LAN cable
- 5) Open  Microsoft Internet Browser and enter IP address e.g. **192.168.0.110** of LAN-Adapter  
(see current IP no. of LAN-Adapter!!)
- 6) Now you get access on the web-interface and you can adjust the R8/16-PCM-ENC

# R8/16-PCM Software setup

## Fist DOWNLOAD parameters for device

**KMT R8-PCM Analog Channel Setup**

Channel	Gain	Type of Strain Gauge	Make Autozero
Channel 1	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 2	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 3	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 4	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 5	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 6	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 7	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 8	125	HALF-BRIDGE	<input type="checkbox"/>

Upload Parameters to R8-PCM and perform Autozero

**Download Parameters from R8-PCM**

KMT Kraus Messtechnik GmbH  
Gewerbering 9  
D-83624 OTTERFING  
Germany  
[www.kmt-gmbh.com](http://www.kmt-gmbh.com)  
[info@kmt-gmbh.com](mailto:info@kmt-gmbh.com)

You can download your stored parameters from the R8/16-PCM-ENC

## Select gain

**KMT R8-PCM Analog Channel Setup**

Channel	Gain	Type of Strain Gauge	Make Autozero
Channel 1	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 2	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 3	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 4	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 5	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 6	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 7	125	HALF-BRIDGE	<input type="checkbox"/>
Channel 8	125	HALF-BRIDGE	<input type="checkbox"/>

Upload Parameters to R8-PCM and perform Autozero

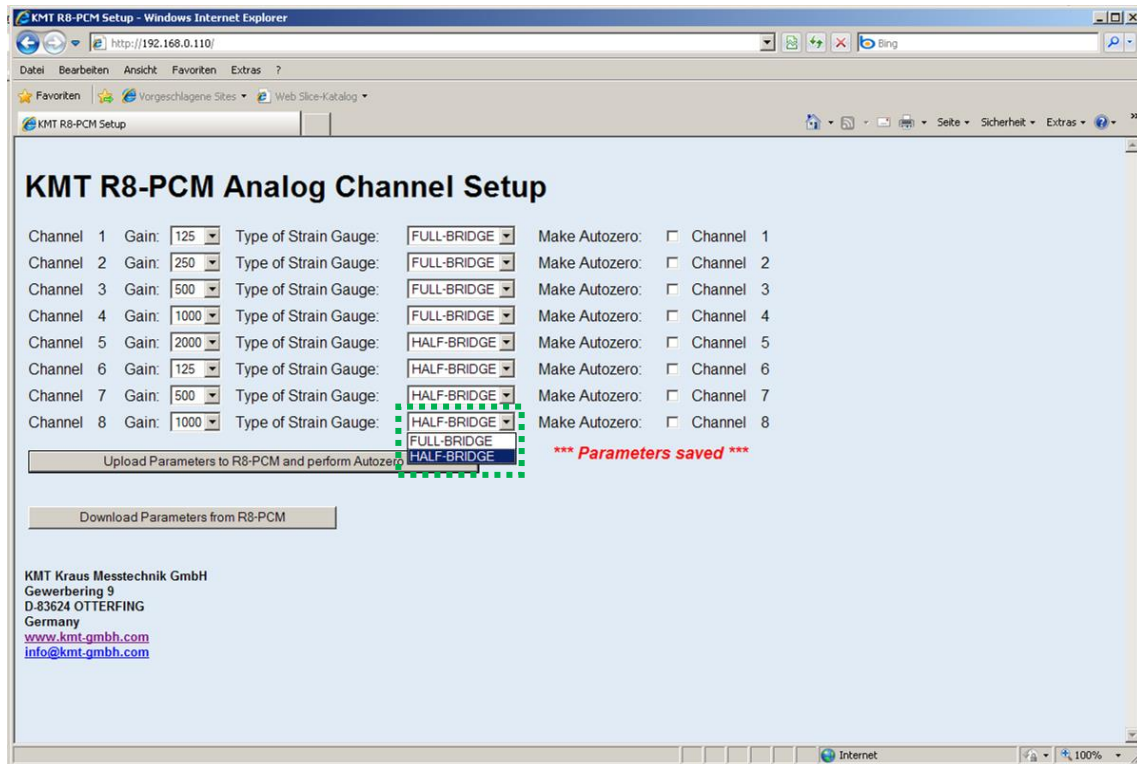
**Download Parameters from R8-PCM**

\*\*\* Parameters saved \*\*\*

KMT Kraus Messtechnik GmbH  
Gewerbering 9  
D-83624 OTTERFING  
Germany  
[www.kmt-gmbh.com](http://www.kmt-gmbh.com)  
[info@kmt-gmbh.com](mailto:info@kmt-gmbh.com)

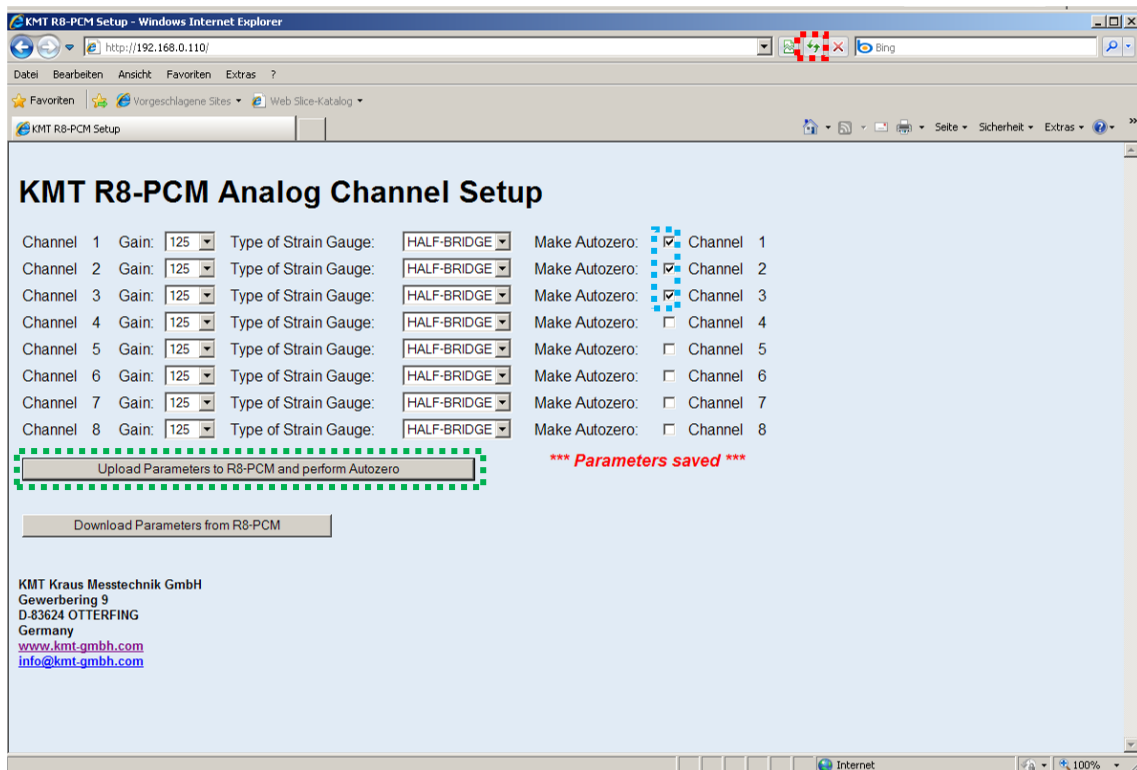
Select gain of 125-250-500-1000 or 2000 by popup window

## BRIDGE setting



Select full- or half bridge popup window

## AUTO-ZERO setting



Select Auto-Zero per channel. The Auto-Zero function will be executed only **one time** per upload the parameters to R8/16-PCM-ENC! It will be stored also after power off in the R8/16-PCM-ENC until you make a **new** Auto-Zero on this channel!

Don't use the refresh button  on your web browser; otherwise the parameters of your web browser cash will upload to the R8/16-PCM-ENC!

## Clear AUTO-ZERO setting

Channel 1 Gain: 1000 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 1

Channel 2 Gain: 1000 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 2

Channel 3 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 3

Channel 4 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 4

Channel 5 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 5

Channel 6 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 6

Channel 7 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 7

Channel 8 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 8

Channel 9 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 9

Channel 10 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 10

Channel 11 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 11

Channel 12 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 12

Channel 13 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 13

Channel 14 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 14

Channel 15 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 15

Channel 16 Gain: 125 Type of Strain Gauge: FULL-BRIDGE Clear Autozero:  Channel 16

**Clear Autozero Values**

*Autozero Parameter Cleared*

Download Parameters from R16-PCM

KMT Kraus Messtechnik GmbH  
Gewerbering 9  
D-83624 OTTERFING  
Germany  
[www.kmt-gmbh.com](http://www.kmt-gmbh.com)  
[info@kmt-gmbh.com](mailto:info@kmt-gmbh.com)

with the special command `http://192.168.0.110/az.clear`  
with this command you clear all AZ setting of all channels!