



# KMT - Kraus Messtechnik GmbH

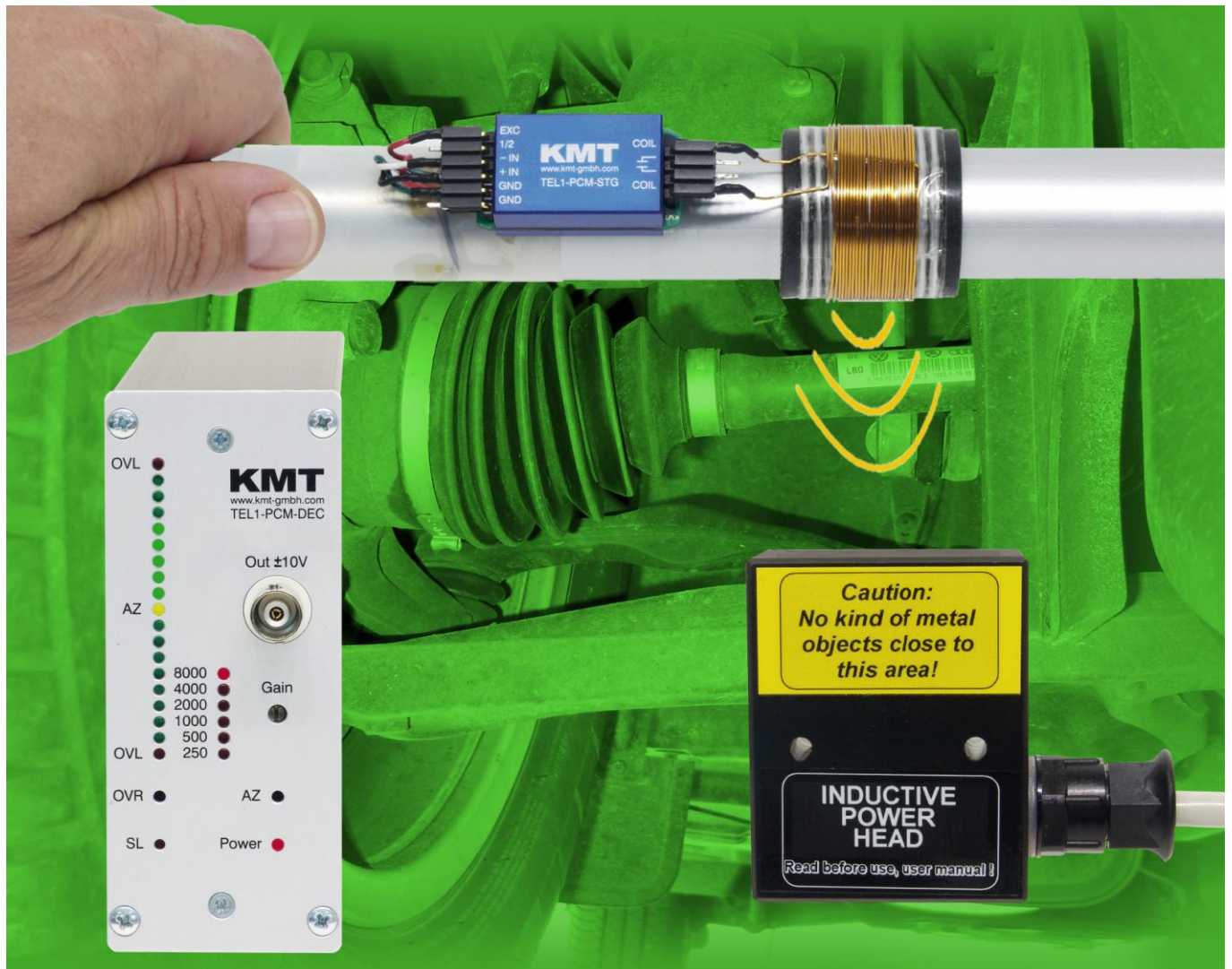


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## TEL1-PCM

### Digital Telemetry System for Strain Gage Applications on Rotating Shafts

*"Gain and Auto Zero setting direct from Receiver Side!"*



- Easy to assemble and operate
- Strain gage sensors (>350 Ohm)
- Full- and half bridge configuration
- Excitation fixed 4 Volt DC
- Auto-Zero adjustment - Setting receiver side
- Gain: 250-8000 - Setting receiver side
- Overload indication
- Digital transmission realized inductively
- Distance up to 25mm (35mm Optional)
- No influence through radio frequency
- Many systems can operated at the same time
- Signal bandwidth 0...1200Hz (-3dB)
- Output +/-10V and digital for interface (Option)
- System accuracy <0.2%

## General Description

The TEL1-PCM single-channel telemetry system offers the easiest handling for the wireless transmission of strain gage signals from rotating shafts. The very small encoder 35 x 18 x 12 mm with a weight of 13g. The transmitter (encoder) part is simply mounted on the rotating shaft with a special fiber reinforced tape.

Powering of the transmission part and the digital data transfer between transmitter and receiver is realized inductively.

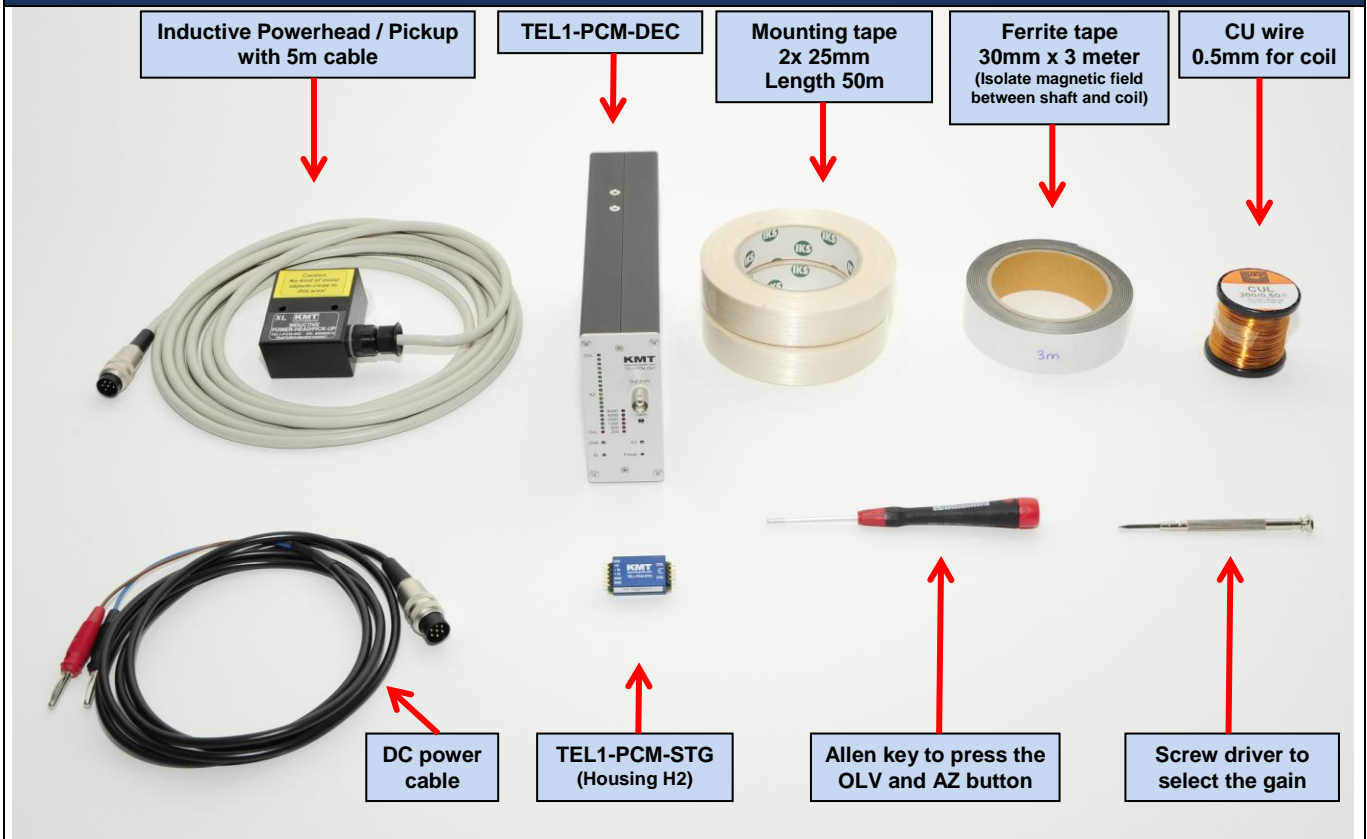
## Functional Description

The TEL1-PCM transmitter provides a pulse code modulated signal (PCM) to an induction winding around the *shaft (max. diameter 500mm, other on request!)*. The magnetic field of this winding enables the inductive transmission of the signal to the pickup coil. From there the signal is transferred by cable (5m) to the receiver. The maximum distance between the transmitter coil and the pickup is 25mm with standard head, optional 35mm

The receiver unit offers a BNC connector at the front panel with analog outputs  $\pm 10\text{ V}$  and a optional a digital output for PCM-LAN IP-Interface. An LED bar indicator shows the actual level and a successful Auto Zero calibration. Overload is indicated by the last LED's in pos. or neg. direction of the bar graph. These OVL-LED's operate in peak-hold mode and are reset by pressing the overload switch.

Strain gage sensors (>350 Ohm) in full- and half- bridge configuration can be directly connected to the transmitter. The excitation is fixed to 4 Volt DC and the gain is set by the gain switch on the receiver side. An auto-zero (AZ) adjustment is executed by pressing the AZ button on the front side of the receiver. The successful AZ operation is indicated by a yellow LED in the middle of the LED bar indicator. When the AZ completes the LED continuously illuminates. The AZ setting is stored in a Flash-RAM and thus is not lost during power-off. Use only shielded sensor cable.

## TEL1-PCM Set Contains:



# Technical Data Transmitting Part:



New version 4.0 without external CAL pins

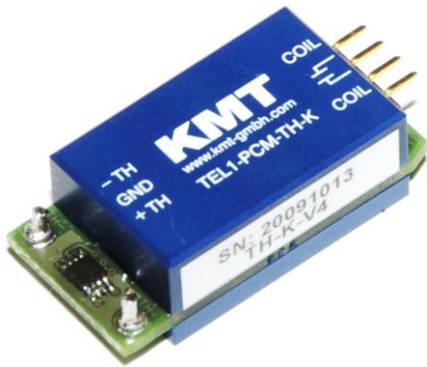
With **built-in** 220nF capacitor for shaft up to 400mm recommend!  
Standard version!



Without built-in capacitor. Only with **external** capacitor! E. g. 100nF for larger shaft >400mm! Specify at order!



with female K type thermocouple connector



with solder pins for thermocouple

Analog signal bandwidth: 0 - 10 Hz (-3 dB)  
Accuracy: +/-0.5 % (without sensor)  
Operating temperature: - 10 to + 80 °C  
Dimensions: 35 x 18 x 12mm (without th-connector)  
Weight: each module 13 grams (with epoxy resin)  
Static acceleration: up to 3000g  
(housing not filled with epoxy resin)  
Static acceleration: up to 10000g  
(housing filled with epoxy resin and without solder pins and external capacitor!)  
Powering: Inductive  
(optional Battery, see TEL1-PCM-BATT!)  
Housing: splash-water resistant IP65  
(except the connector pins)

## TEL1-PCM-STG

Strain gage: Full and 1/2 bridge >350 Ohm,  
Excitation: 4 VDC (fixed)  
Gain: 250; 500; 1000; 2000; 4000; 8000 (selectable from receiver side)

Gain	Resolution	Autozero range
250	12 bit	100%
500	12 bit	200%
1000	12 bit	400%
2000	12 bit	400%
4000	12 bit	400%
8000	11 bit	400%

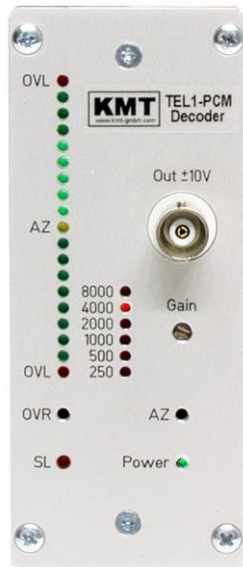
AZ: Auto Zero calibration (selectable from receiver side)  
Analog signal bandwidth: 0 - 1200 Hz (-3 dB)  
Operating temperature: - 10 to + 80 °C  
Scanning rate 7.5kHz  
Dimensions: 35 x 18 x 12mm (without connectors)  
Weight: each module 13 grams (with epoxy resin)  
**Static acceleration: up to 3000g**  
(housing not filled with epoxy resin)  
**Static acceleration: up to 10000g**  
(housing filled with epoxy resin and without solder pins and external capacitor!)  
Powering: Inductive (optional Battery, see TEL1-PCM-BATT!)  
Housing: splash-water resistant IP65 (except the connector pins)

## TEL1-PCM-TH-K - Select Gain 250!

At Gain 500 multiply the values x2, Gain 1000 with x4  
Max. Voltage output at receiver is +10V!

°C	Output at receiver (DEC)		
	Normal (V)	Min. (V)	Max. (V)
0	-0,005	-0,050	0,050
50	0,508	0,450	0,550
100	1,012	0,950	1,050
150	1,505	1,450	1,550
200	2,000	1,950	2,050
250	2,505	2,450	2,550
300	3,010	2,950	3,050
350	3,511	3,450	3,550
400	4,014	3,950	4,050
450	4,511	4,450	4,550
500	5,011	4,950	5,050
550	5,511	5,450	5,550
600	6,010	5,950	6,050
650	6,507	6,450	6,550
700	7,007	6,950	7,050
750	7,507	7,450	7,550
800	8,007	7,950	8,050
850	8,505	8,450	8,550
900	9,003	8,950	9,050
950	9,502	9,450	9,550
1000	9,999	9,950	10,050

# Technical Data Receiving Part



Front



Rear

## TEL1-PCM-DEC

### Front side:

Analogue output: +/-10V via BNC (**Optional 4-20mA output**)  
 Digital output for PCM Interface IF16 (ECIA100) OPTION  
 Gain setting : via screw switch  
 Auto Zero setting: via micro switch  
 Overload LED's (Red ON) reset: via micro switch  
 Green LED's: Bargraph +/-  
 Autozero LED:  
     Yellow ON- successful AZ  
     Yellow OFF- not successful AZ  
     *if flashing, call support of KMT, error in EPROM*  
 Green LED's: Bargraph +/-  
 SL LED: Red ON = if error of data transmitting  
 SL LED: Red Flashing = distance to far  
 Power ON LED: Red ON = if power switch on

### Rear side:

Output to Powerhead: via 6pol. Tugel  
 Fuse LED: Flashing if fuse is defect  
 Powering: 10-30V DC (**min. 24Watt**), Input via 7pol. Tugel  
 Switch: ON/OFF  
 Operating temperature: - 10 to +70 °C  
 Dimensions: 200 x 105 x 44 (without connectors!)  
 Weight 950 grams  
 Static acceleration: up to 200g

System accuracy\*: +/- 0.2 %

*<measure with gain 1000, 350ohm (0.1%) full bridge - test bridge!>*



## TEL1-PCM-Powerhead/Pickup (standard version)

Function: Inductive powering of the TEL1-PCM-STG unit and receiving PCM magnetic field in PCM modulated code  
 Distance between the transmitter coil and the pickup is 25mm (**25mm at diameter <300mm with 5m cable, 15mm with 10m cable**)  
 (Optional 35mm at diameter <300mm - see table)  
 Output to TEL1-PCM-Decoder: Via 6pol. Tugel Plug incl. 5m cable  
 Operating temperature: - 10 to +80 °C  
 Dimensions: 53x66x30mm (without cable)  
 Weight: 200 grams (without cable!)  
 Housing: splash-water resistant IP65 (except connector).  
 Cable length standard 5m! 10m optional!

## Block diagram

