**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 13 g. 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 500 mm, 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 (5 m) to the receiver. The maximum distance between the transmitter coil and the pickup is 25 mm with standard head, optional 35 mm.

The receiver unit offers a BNC connector at the front panel with analog outputs ± 10 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:

- Inductive Powerhead / Pickup with 5m cable
- TEL1-PCM-DEC Mounting tape 2x 25mm Length 50m
- Ferrite tape 30mm x 3 meter (Isolate magnetic field between shaft and coil)
- CU wire 0.5mm for coil
- DC power cable
- TEL1-PCM-STG (Housing H2)
- Allen key to press the OLV and AZ button
- Screw driver to select the gain

Version 2012-10
Technical Data Transmitting Part:

**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)

<table>
<thead>
<tr>
<th>Gain</th>
<th>Resolution</th>
<th>Autozero range</th>
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<tbody>
<tr>
<td>250</td>
<td>12 bit</td>
<td>100%</td>
</tr>
<tr>
<td>500</td>
<td>12 bit</td>
<td>200%</td>
</tr>
<tr>
<td>1000</td>
<td>12 bit</td>
<td>400%</td>
</tr>
<tr>
<td>2000</td>
<td>12 bit</td>
<td>400%</td>
</tr>
<tr>
<td>4000</td>
<td>12 bit</td>
<td>400%</td>
</tr>
<tr>
<td>8000</td>
<td>11 bit</td>
<td>400%</td>
</tr>
</tbody>
</table>

AZ: Auto Zero calibration (selectable from receiver side)

Analog signal bandwidth: 0 - 1200 Hz (-3 dB)
Operating temperature: - 10 to + 80 °C
Scanning rate 6.944kHz
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)

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**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!

<table>
<thead>
<tr>
<th>°C</th>
<th>Normal (V)</th>
<th>Min. (V)</th>
<th>Max. (V)</th>
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<td>-0.050</td>
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<td>50</td>
<td>0.508</td>
<td>0.450</td>
<td>0.550</td>
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<tr>
<td>100</td>
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<tr>
<td>300</td>
<td>3.010</td>
<td>2.950</td>
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<tr>
<td>1000</td>
<td>9.999</td>
<td>9.950</td>
<td>10.050</td>
</tr>
</tbody>
</table>

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)

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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

Version 2012-10
Technical Data Receiving Part

**TEL1-PCM-DEC**

*Front side:*
- Analogue output: +/-10V via BNC *(Optional 4-20mA output)* *(delay between analog IN/OUT 15ms constant!!)*
- 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. Tuchel
- Fuse LED: Flashing if fuse is defect
- Powering: 10-30V DC *(min. 24Watt)*, Input via 7pol. Tuchel
- Switch: ON/OFF
- Operating temperature: - 10 to +70 °C
- Dimensions: 200 x 105 x 44 (without connectors!)
- Weight 950 grams
- 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. Tuchel 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*