TEL1-PCM-BATT

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
- External shunt calibration
- Digital transmission realized inductively
- Distance up to 150mm
- Powering of transmitter part via battery 6-9V
- 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)
- Output 4-20mA (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.

The data transfer between transmitter and receiver is digital. The powering of the transmission part by the TEL1-PCM BATT is supplied by 6-9V battery.

Functional Description

The TEL1-PCM-BATT transmitter provides a pulse code modulated signal (PCM) to an induction winding around the shaft. The magnetic field of this winding enables the inductive transmission of the signal from coil to pickup. From there the signal is transferred by cable (5 m) to the receiver. The maximum distance between the transmitter coil and the pickup is 150mm.

The receiver unit offers a BNC connector at the front panel with analog outputs ± 10 V and a optional a digital output for PCM interface ECIA100 (for notebooks) or IF16 (PCI Desktop). 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. The yellow LED flashes as long as the AZ is in progress. When the AZ completes the LED continuously illuminates. A continued flashing of the yellow LED indicates some error in the AZ electronics. In this case please contact the support of KMT. The AZ setting is stored in a Flash-RAM and thus is not lost during power-off. Use only shielded sensor cable.

TEL1-PCM-BATT Set Contains:

- Inductive PH-Pickup with 5m cable
- TEL1-PCM-BATT-DEC (Decoder)
- Mounting tape 2x 25mm Length 50meter
- Ferrite tape 30mm x 3 meter (isolate magnetic field between shaft and coil)
- DC-Power cable
- TEL1-PCM-BATT-STG (Encoder for strain gages)
- 6V Lithium battery
- Hexagon key to activate the OLV and AZ switch
- Screw driver to set the gain
- CU wire, 0.5mm for coil (insulated with lacquer)
Technical Data

TEL1-PCM-STG-BATT
Straingage: Full and 1/2 bridge >350 Ohm,
Excitation: 4 VDC (fixed)
Gain: 250; 500; 1000; 2000; 4000; 8000 (select able from receiver side)

<table>
<thead>
<tr>
<th>Gain</th>
<th>Resolution</th>
<th>Autozero range</th>
</tr>
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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>
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</tbody>
</table>

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: 13 grams
Static acceleration: up to 1000g
TEL1 PCM BATT Powering: By battery 6-9V
Power consumption: 70mA
Housing: splash-water resistant (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!

<table>
<thead>
<tr>
<th>°C</th>
<th>Calibrator out (mV)</th>
<th>Normal (V)</th>
<th>Min. (V)</th>
<th>Max. (V)</th>
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<tbody>
<tr>
<td>0</td>
<td>-1.203</td>
<td>0.06</td>
<td>0.01</td>
<td>0.11</td>
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<tr>
<td>50</td>
<td>0.820</td>
<td>0.50</td>
<td>0.45</td>
<td>0.55</td>
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<td>100</td>
<td>2.893</td>
<td>1.00</td>
<td>0.95</td>
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<td>150</td>
<td>4.935</td>
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<td>2.41</td>
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<td>1000</td>
<td>40.072</td>
<td>9.90</td>
<td>9.85</td>
<td>9.95</td>
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</tbody>
</table>

Calibrator OMEGA CA71S3, measure at a clamping point temperature of 30°C (after 30 min run time)

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: Battery with 6-9V, Power consumption: 70mA
Housing: splash-water resistant IP65
(except the connector pins)
TEL1-PCM-DEC

**Front side:**
- Analogue output: +/-10V via BNC (Optional 4-20mA)
  *(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 = if the battery is empty
- 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
- Static acceleration: upto 200g
- System accuracy*: +/- 0.2 %
  *<measure with gain 1000, 350ohm (0.1%) full bridge - test bridge!>*

TEL1-PCM-Pickup

Function:
- Receiving PCM magnetic field in PCM modulated code Distance between the transmitter coil and the pickup is 5-150mm
- 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! Longer on request, but max. 50m!