MT1-PCM
Digital Radio 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
- Powering through Lithium battery, >12h work time
- Distance 1-10 meter (rotating application)
- Up to 8 system can work in different radio freq.
- Signal bandwidth 0…500Hz (-3dB)
- Output +/-10V
- System accuracy <0.2%
General Description

The MT1-PCM single-channel telemetry system offers the easiest handling for the wireless radio transmission of strain gage signals from rotating shafts.

The encoder has dimensions (MT1-PCM-STG) of 62x27x11mm (without connectors) and transmitter (40k-Tx) of 62x27x11mm (without connectors). Each module has a weight of about 30g. The encoder/transmitter parts are simply mounted on the rotating shaft with a special fiber reinforced tape and add steel trip.

Powering of the transmission part is with battery 6-9V, power consumption 90mA. The digital data transfer between transmitter and receiver is realized by radio frequency 433MHz or 868MHz, transmitting power 10mW

Functional Description

The MT1-PCM transmitter transmits a digital radio frequency signal to the receiver. The distance between transmitter and receiver (depends of application) is 1-10 meter. "Not rotating Point to Point application upto 100m at free view"

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

MT1-PCM Set Contains:

- Receiving Antenna With Cable (4m)
- MT1-PCM-DEC (Receiver Unit)
- DC Power Cable
- Mounting Tape 25mm
- Mounting Tape 50mm
- Wire for Cable loom
- 1x Hexagon key (for AZ & OVR switch setting)
- 1x Screw driver (for gain setting)
- 6V Lithium Battery CR-P2 (1600 mAh) >12h operating time
- MT1-PCM-STG (encoder) and 40k-Tx (transmitter) with Wire Antenna
**Technical Data - Transmitter**

**MT1-PCM-STG**

- **Strainage:** 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>Autozero range</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>100%</td>
</tr>
<tr>
<td>500</td>
<td>200%</td>
</tr>
<tr>
<td>1000</td>
<td>400%</td>
</tr>
<tr>
<td>2000</td>
<td>400%</td>
</tr>
<tr>
<td>4000</td>
<td>400%</td>
</tr>
<tr>
<td>8000</td>
<td>400%</td>
</tr>
</tbody>
</table>

- **Shunt Cal:** Via external resistor for positive and negative calibration
- **Analog bandwidth:** 0 - 500 Hz (-3 dB)
- **Operating temperature:** -10 to +80 °C
- **Scanning rate:** 2000 Hz
- **Resolution:** 12bit (ADC)

**40k-Tx transmitter:**

- **Carrier frequency:** 433MHz or 868MHz, 10mW transmitting power
- **Dimensions:** MT1-PCM-STG = 62x27x11mm (without connectors)
- **Weight:** each about 30 gram (without cables)
- **Static acceleration:** up to 3000g (only with inductive power!) with lithium battery about 1000g
- **Powering:** MT1-PCM-STG by battery 6-9V (powering 40k-Tx through MT1-PCM-STG, +5V/GND)
- **Power consumption:** 90mA
- **Operating time:** with CR-P2 Lithium 1600mAh battery about >12h

Optional: Inductive powering

**MT1-PCM-VOLT**

- **High level inputs:** +/- 20, 10V, 5V, 2.5V, 1.25V or 0.625V
- **Range:** 250; 500; 1000; 2000; 4000; 8000 (selectable from receiver side)

<table>
<thead>
<tr>
<th>INPUT range</th>
<th>Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>+/- 20V</td>
<td>250</td>
</tr>
<tr>
<td>+/- 10V</td>
<td>500</td>
</tr>
<tr>
<td>+/- 5V</td>
<td>1000</td>
</tr>
<tr>
<td>+/- 2.50V</td>
<td>2000</td>
</tr>
<tr>
<td>+/- 1.250V</td>
<td>4000</td>
</tr>
<tr>
<td>+/- 0.625V</td>
<td>8000</td>
</tr>
</tbody>
</table>

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- **Operating time:** with CR-P2 Lithium 1600mAh battery about >12h

Optional: Inductive powering

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*Technical Data are subject to change without notice!*
## Technical Data - Receiver

### MT1-PCM-DEC

<table>
<thead>
<tr>
<th>Front side</th>
<th>Rear side</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analogue output:</strong></td>
<td>Antenna: Input for receiving antenna</td>
</tr>
<tr>
<td>+/-10V via BNC</td>
<td><strong>RF Level:</strong> LED indicator for radio frequency</td>
</tr>
<tr>
<td><strong>Resolution:</strong> 12bit (DAC)</td>
<td><strong>Fuse LED:</strong> Flashing if fuse is defect</td>
</tr>
<tr>
<td><strong>Gain setting:</strong> via screw switch</td>
<td><strong>Powering:</strong> 10-30V DC, Input via 7pol. Tuchel</td>
</tr>
<tr>
<td><strong>Auto Zero setting:</strong> via micro switch</td>
<td><strong>Switch:</strong> ON/OFF</td>
</tr>
<tr>
<td><strong>Overload LED’s:</strong> (Red ON) reset: via micro switch</td>
<td><strong>Operating temperature:</strong> -10 to +70 °C</td>
</tr>
<tr>
<td><strong>Autozero LED:</strong></td>
<td><strong>Dimensions:</strong> 200 x 105 x 44 (without connectors!)</td>
</tr>
<tr>
<td>Yellow ON: successful AZ (output signal &lt; +/-30mV)</td>
<td><strong>Weight:</strong> 950 grams</td>
</tr>
<tr>
<td>Yellow OFF: not successful AZ (output sign. &gt; +/-30mV)</td>
<td><strong>Static acceleration:</strong> up to 200g</td>
</tr>
<tr>
<td>If flashing, call support of KMT, error in EPROM</td>
<td><strong>System accuracy</strong> (without sensor): +/-0.2 %</td>
</tr>
</tbody>
</table>

- **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