

DIGITAL TRANSMISSION PCM OR FM TRANSMISSION?

Both methods have their strengths and weaknesses. MANNER Sensor Telemetry is of modular design and – depending on the respective application – features both transmission methods.

Which of the two methods is more suitable depends on the problem in hand. FM modulation (FM technology) is without a doubt the most interference-free form of transmission. In digital transmission even one bit error can falsify the total measuring value by 100%. There again, digital transmission technology provides higher resolution, simpler further processing in the receiver, and the respective transfer to the measuring data collection system, since the need for any transducer is eliminated.

In the case of applications where space is at a real premium (piston telemetry, gear applications and environmental extremes with ambient temperatures of up to +150 °C), FM technology is producing better results at present. A digital conversion process requires

more electronics, and the components necessary can only be used in a maximum temperature of approximately 120 °C. Larger space requirements and limited application temperatures are thus required. Moreover, the reliability of the rotor electronics is very dependent on the number of components that are needed. Rotor electronics with 8 measuring channels in a 10 x 22 x 32 mm housing and featuring PCM technology cannot yet be realized by today's technology.



DIGITAL TRANSMISSION PCM

On the "PCM technology" version, the amplified and time division multiplex sensor signal is digitalized, encoded and then transmitted via the inductive bidirectional line using an A/D transducer. On systems with higher resolution each sensor signal is digitalized and the resulting digital datastreams are multiplexed. The digitalized sensor signal is either taken over digitally by the measuring computer (RS 232/RS 485 or optical link) or is available as an analog measuring signal (0 - +10 volts) at the receiver output.

FM TRANSMISSION

On the "PCM technology" version, the amplified and time division multiplex sensor signal is converted using a U/F transducer with 14-bit resolution into a frequency proportional to the measuring value and transmitted via the inductive bidirectional line. The amplified frequency-modulated sensor signal is either available as an analog measuring signal (0 - +10 volts) at the receiver output, or can be directly taken over by the measuring computer via the RS 232/RS 485 optional interfaces.

ANTENNA MULTIPLEX

On the "antenna multiplex" sensor telemetry version, each amplified sensor signal is converted into a frequency proportional to the measuring value via a U/F transducer with 14-bit resolution and transmitted via the inductive bidirectional line. Each measuring channel has its own bidirectional line. The space requirements per bidirectional line are 10 mm, so 4 transmission channels would therefore require 40 mm of shaft. With antenna multiplex up to 40 kHz bandwidth per channel can be realized.