

# LED Powered Rotor Telemetry System

Telemetry system | optical energy transmission | optical data transmission

This telemetry system can be used for contactless data communication between a rotor and a stator unit. Unlike conventional systems, it relies solely on optical data and energy transmission. A single optical channel realized by an air gap between the stator and rotor unit is already sufficient for full system functionality.

## background

Measuring physical quantities such as temperature, acceleration, pressure or strain in rotating shafts is a common requirement in industrial applications and test facilities. Since direct wiring is not a feasible option, existing measurement systems rely on technologies such as slip rings, magnetically coupled coils, or a combination of batteries and wireless communication. Each of these methods has its own distinct advantages and disadvantages.

## benefits

- Contactless energy and data transmission
- Suitable for high rotational speeds
- Data communication and energy transmission over the same optical channel
- Simple integration of rotation angle sensor possible
- Insensitive to relative motion between rotor and stator unit
- Low-cost solution by using broadly available components

## potential applications

R&D testing, production testing, troubleshooting, on-road testing

## IPR

Patent filed

## development status

Proof of Concept

## inventors

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## technology

The technology offered overcomes the disadvantages of conventional telemetry solutions using optical data and energy transmission. This technology enables the realization of a telemetry system where both energy and data can be transmitted between a rotor and stator unit in a single optical channel.

Transmission in a single optical channel is achieved by using either time-division multiplexing (TDM) or wavelength-division multiplexing (WDM). This enables a particularly compact system that offers a wide range of possible applications.

By applying this technology, an intelligent telemetry system can be realized (Fig.1, Fig. 2), capable of interacting with a broad range of sensors.

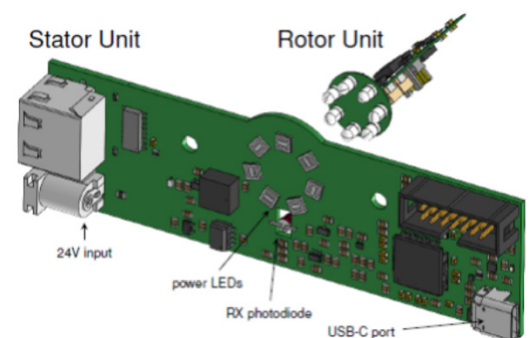


Figure 1: Possible system realization

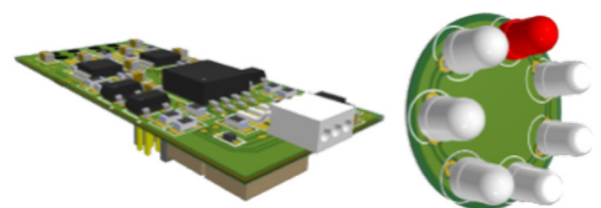


Figure 2: Possible realization of the rotor unit