

LIGHT IN MOTION

FIBER OPTIC RAIL PAD SENSORS – FORPS –

Prepared for The Future

SENSOR LINE

Your Partner for LIGHT IN MOTION
~ 20 Years of Experience ~

● FIBER OPTIC SENSOR TECHNOLOGY

BENEFITS

Our fiber optic sensors are used in a wide range of applications. Years of experience in road and railroad are the base of our sensors. Especially the Fiber Optic Rail Pad Sensor, FORPS, is a result of thorough development and manufacturing engineering. Fiber optic sensors use the advantage of static response, the maximum speed is only limited by the electronic behind it. Due to their principle, all SENSOR LINE fiber optic sensors are fail-safe. And FORPS has a lot more to offer: train detection, flat wheel detection, vibration analysis, weighing and rail bed maintenance.

FORPS is installed inside rail and sleeper, the installing is possible without any disturbance of traffic and allows maintenance without de-installation. The inherent self-test capability can be used to check your system and preserve the reliability of your application.

Fiber optic sensors are immune to electro-magnetic disturbance, eddy current and electromagnetic rail brakes, under-floor transformers and lightning.

The principle of the construction comprises durability and protection against the effects of environment and time. They contain no metal parts which could corrode, and the functional components are proof-infused in robust synthetic materials.

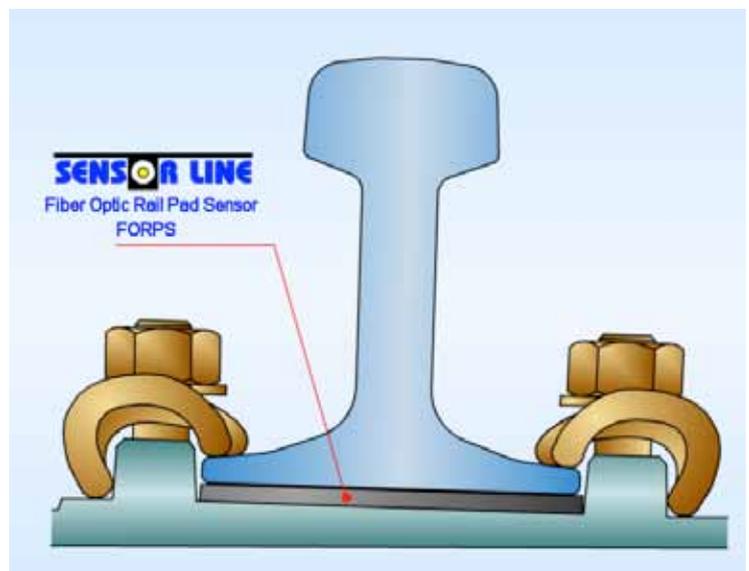
Every sensor is tested before distribution. All relevant data is being recorded.

APPLICATIONS

- Train detection
- Train recognition
- Analysis of track superstructure
- Any kind of frequency based analyses (e.g. flat wheel detection)
- Weighing
- Track maintenance
- Mining applications

NEW: RFID INSIDE

Radio-frequency ID chips in the sensors serve as unique serial numbers. Free memory bytes are available for customers. Identifying, tracking and capturing data has never been easier in the field.



● FORPS



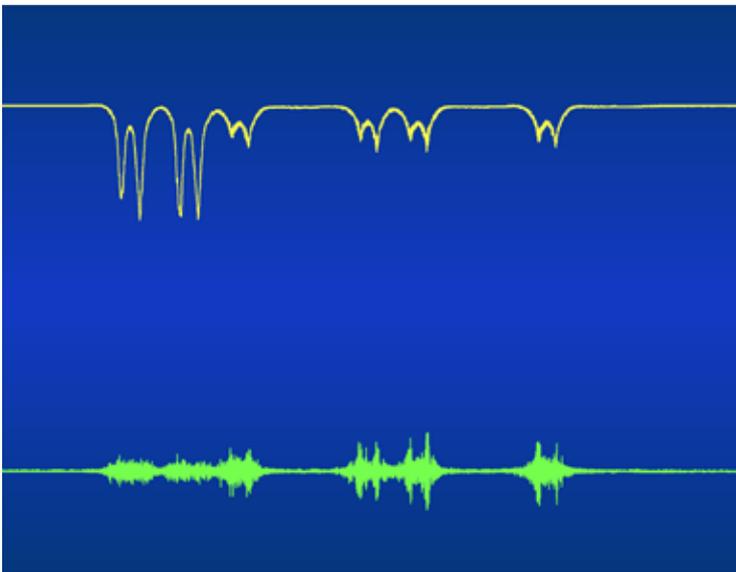
FORPS IN DETAIL

FORPS are available for different rail dimensions: UIC60E1, UIC54E1 and UIC49E1, which are the following widths: 125mm, 140mm, 150mm. We are also able to manufacture up to a width of 165mm (for more details please contact us). Standard thickness is 7mm for the rail pads (9mm for high speed FORPS). Temperature sensors are optional. Standard feeder lengths are 5m, 10m, 15m and 20m. The cable is protected against rodents.

Maximum axle load is 100kN and the minimum detection load is 100kg. High durability up to 5 million axles is guaranteed. The operating temperature ranges from -30°C up to +85°C. Stiffness is about 95kN/mm.

FEATURES

- Low cost railroad sensor
- Fail-safe sensor system
- Easy installation without any mechanical machining
- Available for every rail system
- Available with integrated temperature sensor
- Maintenance-free
- Passive sensor system and immune against EMI
- True static signal response
- High sensor durability
- No adjustment necessary for train detection
- Easy testing and handling
- Well protected (e.g. sabotage, theft and game bite)
- ROHS conform



ELECTRONIC INTERFACE

In order to convert optical signals into digital electrical signals, usually an Optical Transmittance Analyzer is required. The main function of the electronic is conversion, but it is also essential to adapt the optical sensor to the processing behind it. Therefore, the output arrangement is designed to build potential-free signals in two different implementations (positive or negative active).

The device is able to indicate some kind of malfunction by using two opto-isolated outputs. When both outputs are set active-non-conductive, shorting is possible to detect.

The electronic interface works in a wide voltage range (18Vdc to 36Vdc) and has low current consumption. The mechanical design is dimensioned to assemble the board in a customary housing for railroad applications with cable passages suitable for use in a rougher environment.

If it is necessary to adapt FORPS to specific customer applications, we will find a solution.



● MICROBENDING – THE VIABLE SENSING SOLUTION

An optical fiber has a glass core surrounded by a cladding of lower refractive index. Light travelling inside the core cannot enter the cladding but rather is reflected without any loss. However, guiding light over long distances in this manner requires the fiber to be even-shaped and straight and the refractive index to be very uniform. Stressing the fiber at a point not only causes a kink but also invokes changes of refractive index, thus severely violating both of these requirements. Light then escapes from the fiber core. This loss can be measured as a decrease in the optical power arriving at the fiber's end. This is the principle used inside of SENSOR LINE's fiber optic axle sensors. Unlike any other fiber optic sensing principles, it does not require a specially treated fiber or any additional optical components.



● LIGHT IN MOTION – 20 YEARS OF EXPERIENCE

What began in 1996 with the innovative idea of detecting pressure by light in the field of road traffic has grown into a globally operating, market-leading sensor company with over 20 employees who are committed to delivering the highest level of quality and satisfaction to its customers. With its unique fiber optic technology, SENSOR LINE has developed various applications for road, airport and railroad traffic.

True to its slogan "Prepared for The Future", the Schrobenhausen-based company plans to intensify its push into the railroad market as well as deepen its focus on bicycle traffic.

SENSOR LINE owes this achievement to the vision of its founder Fred Motzko and the dedication of its employees.

"This year is a great accomplishment and marks a major milestone for us as we celebrate 20 years in business," says Juergen Peter, CEO of SENSOR LINE. "On behalf of the entire team, I want to thank all of our customers and partners for making us part of their business success."



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