Directory

ZÖLLNER

Infrastructure Solutions Both Preventive and Reactive

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Preventive Cable Monitoring System MPX V3 Reduces Train Delays

The vision of ZÖLLNER's product line for infrastructure solutions is to significantly contribute to mobility changes – convincing more and more people to use the railway is necessary to tackle climate change. Therefore, we need to make the railway infrastructure more resistant to sudden failures that lead to train delays and in consequence to less public acceptance of the railway. One solution to reach this goal is the preventive cable monitoring system MPX V3 – continuously tracking humidity and insulation values on the cable infrastructure to detect and evaluate quality degradations **before** they lead to failures.

Brief Introduction to the System

The control unit of the MPX V3 is integrated into signal boxes and can measure insulation values of the outgoing cables themselves as well as humidity values in cable cabinets using data provided by patented passive sensors [Fig. 1].

The MPX system can be configured individually from five up to 19 measuring channels which consist of up to five partial measuring sections each. Values of the interlocking system's ground fault detector, Bender IRDH265, can also be monitored by the MPX V3. In addition, the system can be extended by four channels recording the interfering voltages acting on the cable. Since the MPX V3 uses two free cable cores for measurements, it is not interfering with the superior system.

The collected data is always available – directly at the touch display of the main unit, remotely via LTE connection or in semi-annual reports of the manufacturer including recommendations when and where to take action.

The system has product approval from Deutsche Bahn, is now installed in more than 10 signal boxes and has already proven itself in practice.

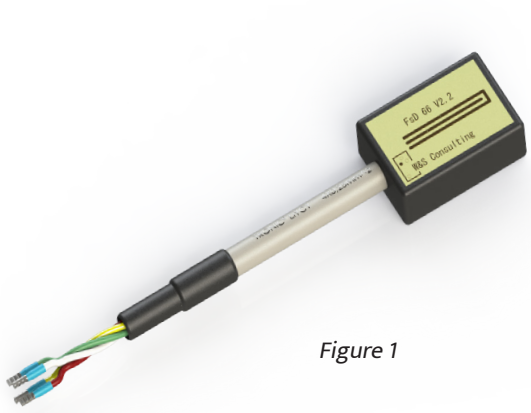

Figure 1

Practical Examples

Typically, degradation due to water ingress is a gradual process as can be seen in Fig. 2. The insulation value of the cable is continuously decreasing. In this case, the degradation is assumed to follow a linear trend and a point in time when the cable is likely to fail can be predicted quite accurately.

If seasonal effects occur on the infrastructure as shown in Fig. 3, the troubleshooting appears to be more complex. In this example the system monitors decreasing insulation during the colder and rainy months of the year while the cable's insulation recovers in the warmer months. The system also recognises

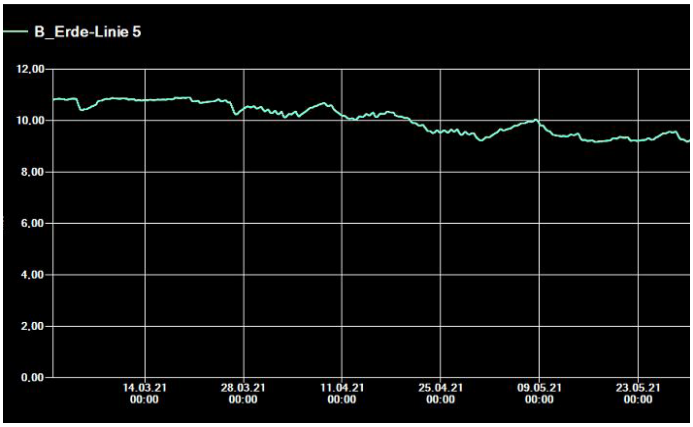

Figure 2

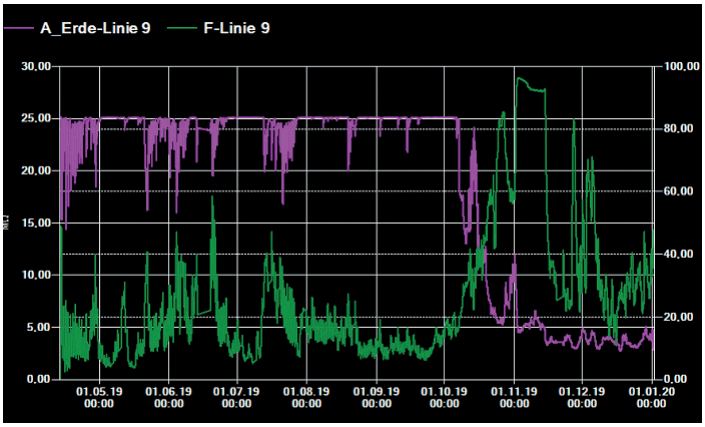

Figure 3

a cable cabinet with high humidity values – by drying and repairing the affected cable cabinet the loss of insulation has been successfully prevented for the next winter.

Your Benefits

The MPX V3 offers several benefits. By predicting possible failures of the cable infrastructure, the system enables targeted preventive maintenance – measures and repairs can be planned more efficiently and costs can be reduced. In addition, in the actual situation of long procurement times, specific cables can be ordered on time. Moreover, the risk of train delays due to cable interference can be reduced, stabilising the network infrastructure.

ZÖLLNER Speed-Monitoring Unit Prevents Speeding Accidents

Under certain circumstances the effects of speeding in rail transport can be catastrophic. For this reason, ZÖLLNER has developed systems to measure and monitor the speeds of rail vehicles with high precision and to switch components on the basis of this information. An innovative solution which reduces the amount of hardware needed compared to the classic 3-magnet-system is the ZGP, the ZÖLLNER speed-monitoring unit.

System Overview and Function

ZÖLLNER's system for train protection basically consists of a wheel sensor from Frauscher, any track magnet and the main unit ZGP [Fig. 4].

The necessary train information, including a value for the speed of the rail vehicle, is generated at the wheel sensor and forwarded to the ZGP. A secure comparison of the actual and target speeds now takes place within the ZGP – the latter can be easily configured on the main unit.

If the determined speed now exceeds the preset limit value, the track magnet is activated in the classic variant of the ZGP. The rail vehicle equipped with a counterpart is accordingly forced to stop.

Flexible System – Flexible Interfaces

The ZGP system is flexible in multiple ways. First, the system can be used either in a stationary position [Fig. 5], for example mounted alongside the track or inside an interlocking system, or in a mobile setting, where the complete

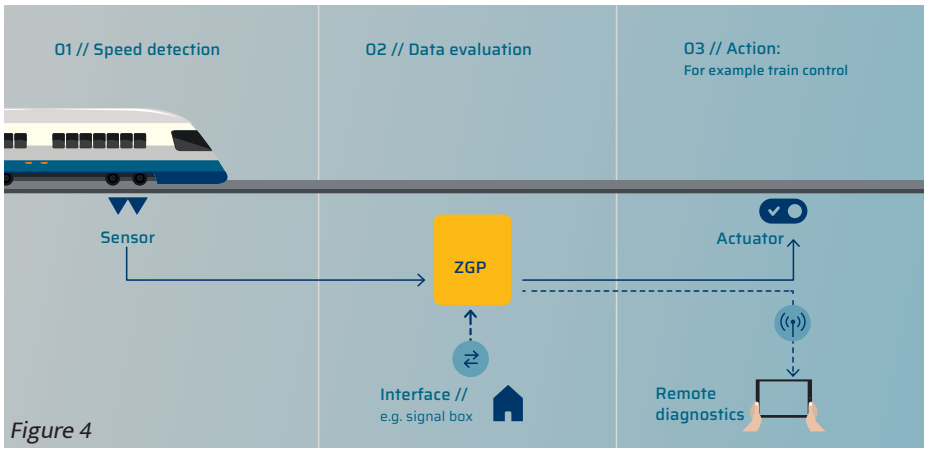

Figure 4

functionality of the stationary ZGP is implemented in a portable case that can be mounted on a tripod [Fig. 6].

Additionally, the system interfaces can be adjusted according to specific needs. The current system can handle different input signals from the interlocking system or a Frauscher wheel sensor and can switch different types of track magnets – but the system could also be modified to other specific use cases.

Figure 5

Practical Example – The ZGP Is Coming Home

Originally developed for the Austrian market with up to 1000 devices installed there by the ÖBB, the ZGP is now also entering the German market. In the new version for the German light rail operator VGF, Verkehrsgesellschaft Frankfurt am Main, the logic behind the control of the track magnet is inverted. The track magnet is permanently active and is deactivated when the correct speed is maintained. Currently 29 systems are being integrated into Frankfurt's light rail infrastructure to prevent trains from entering the train station with excess speed to avoid them running over the end of the track.

Outlook

Even if the ZGP's entry into the German market was an important goal for ZÖLLNER, the ZGP's journey continues straight ahead. For the future, use on other light rail and branch lines as well as on the main lines of Deutsche Bahn is being considered. In addition, work is currently underway to integrate the ZGP into the ZÖLLNER Cloud in order to be able to use the information generated at the ZGP remotely in the best possible way.

Figure 6