Leuze electronic

the sensor people

Application Report

Traffic safety with Leuze electronic

One-way Light Beam Devices monitor vehicle heights

Originally, overheight monitoring for trucks in the "Berg Bock" highway tunnel was done by mechanical systems. But the aluminum rails damaged by vehicle impact had to be repaired or exchanged every time. A new solution which prevents this is based on the functionality of Leuze electronic One-way Light Beam Devices.

When the radio channel “Antenne Thüringen” reports of a traffic jam on the A71 in the area of the Suhl highway interchange and the Suhl/Zella-Mehlis connection, the cause could be a closure of the "Berg Bock" tunnel which is located in between – possibly produced an overloaded or extra-long vehicle. One-way Light Beam Devices from Leuze electronic series LS 96 prevent this situation from getting any worse (Figure 1). They are mounted to sign gantries or measuring bridges a few hundred meters from the entrances to the tunnel and always trigger a closure when an overheight vehicle trips the infrared light beam (Figures 2a/b).

Mechanical systems have weaknesses

Originally, overheight monitoring in the "Berg Bock" highway tunnel was done by mechanical systems. The red and white aluminium rails, visible from a distance, were mounted in such a way that they could teeter to the side if an overheight vehicle drove by (Figures 3a/b/c). The signal which this simultaneously triggered leads to a closure

in front the tunnel portals via a signaling system. According to the Thuringia State Office for Construction and Transportation, these incidents happen several times a year - and the aluminum rails damaged by vehicle impact had to be repaired or exchanged every time! Due to the costs connected to this, a long-term economical solution which also had to be reliable and largely maintenance-free was sought with the help of local engineering firm Keller.

Bernd Keller, who primarily works in controller manufacturing and switching cabinet manufacturing from Zella-Mehlis saw a solution to this problem in the functionality of One-way Light Beam Devices such as are, among others, used in plant engineering and automation. Supported by the sensor people at Leuze electronic and after extensive experiments, series LS 96 proved itself to be most optimally suited to the task.

Optical solution from Leuze electronic

The One-way Light Beam Devices consist of transmitters and receivers which are mounted at a height of 4.5 m, across from each other on the columns of sign gantries. The robust metal housing with glass covers with protection rating IP 67 or IP 69K are designed for industrial use and fulfill the requirements on the highway for every type of weather. The infrared light in particular ensures high functional reliability and increased indifference to ambient light e.g. direct sunlight. Thanks to their optics heating, the devices are also armed against snow and ice at low temperatures down to -35 °C. *"Furthermore, the device version with an operating range limit up to 150 m features sufficient performance reserve to bridge distances of 20 to 25 m between transmitter and receiver interference-free, depending on the number of lanes"*, added Keller.

Redundancy guarantees reliability

So that leaves, birds or other types of disturbance don't lead to faulty operation, induction loops are embedded into the lanes. In addition to the One-way Light Beam Devices, they detect every vehicle in the lanes. Moreover, the Light Beam Devices are installed in pairs. This redundancy ensures that every overheight vehicle is detected, and radio channels like “Antenne Thüringen” won't have to report traffic jams caused by tunnel closures due to overheight vehicles.

Further tunnel optically safeguarded

The advantages of the optical system are obvious. Therefore, four additional high monitors with eight pairs of LS 96 (transmitter and receiver) were implemented by Keller at the entrances of the Pörzberg Tunnel, the new Schaala local bypass near Rudolstadt (Figures 4a/b).

Figures and captions

Figure 1. *Robust metal housing and heatable optics are two important components of the LS 96 One-way Light Beam Device from Leuze electronic. Engineering firm Keller has designed alignment and sealing systems for this application.*

Figures 2a/b. *The robustly built LS 96 One-way Light Beam Devices from Leuze electronic also fulfill the requirements on the highway for every type of weather. Redundantly installed, these One-way Light Beam Devices also guarantee maximal functional reliability outdoors.*

Figures 3a/b/c. *Mechanical* systems *can be easily damaged by collisions, and several replacements a year due to damage is not uncommon. In addition, they are much more expensive than optical solutions.*

Figures 4a/b. *The LS 96 One-way Light Beam Devices from Leuze electronic installed by engineering firm Keller on the columns of the sign gantries fulfill the functions of the red and white aluminum rails – here at the entrance to the Pörzberg Tunnel, the new Schaala local bypass near Rudolstadt.*

Press inquiries
Leuze electronic GmbH + Co. KG
Matthias May, Tel. +49 8141 5350-123
matthias.may@leuze.de, www.leuze.com