

Temperature-sensing optical cable inside the tunnel



Overview

High-resolution temperature sensing with Raman-OFDR using optical communication fiber cables shows great potential as it allows the surveillance of several kilometers of underground transport facilities without the need for installing sensing equipment in the tunnels. Bandweaver's FireLaser distributed temperature sensing (DTS) technology has a successful track record in applications within road tunnel infrastructure. This environment has very specific demands of any solution, such as low maintenance, low cost of ownership, high reliability, and effective fire. Our developed DTS (distributed temperature sensor) system enables precise location of fire event and also heat detection by laying fiber cables along few kilometers length of tunnel. A review of the investigations was conducted, and previous research on linear heat detection was examined. The characteristics and operational parameters of a complete DTS-based LHD. Vibration caused by driving in the tunnel; Electromagnetic interference caused by locomotive start and stop; The humid environment inside the tunnel; Rats inside the tunnel may bite equipment and cause damage; Other interferences that affect system operation.



Article Content

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It is important that the sensing cable is installed carefully so that the cable parameters are not exceeded. Depending on the tunnel size and dimensions, one or two cables may be required.

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A fiber optic cable can be installed linearly along surface of tunnel and can provide thousands of measurement points at 1 meter resolution. This means every single meter reading will ...

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Layout of temperature sensing optical cables in interval tunnels. The heat sources for sensing environmental temperature through temperature sensing optical fibers include radiative heat and ...

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Distributed temperature sensor model for linear heat detection in ...

The developed model allows to tracking temperature changes of the DTS sensor cable with satisfactory precision and can be applied in various tunnel fire analyses.

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Distributed Temperature Sensing (DTS) | AP Sensing

Distributed Temperature Sensing (DTS) systems provide temperature information for accurate thermal monitoring, fire detection, and condition assessment by utilizing standard fiber optic cables.

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