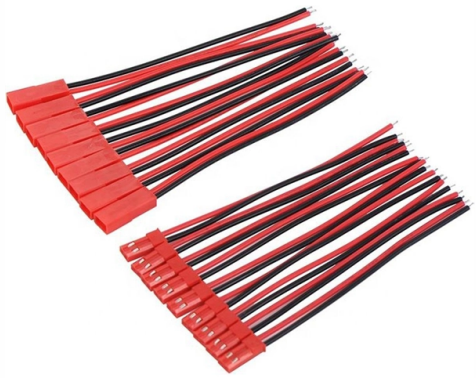
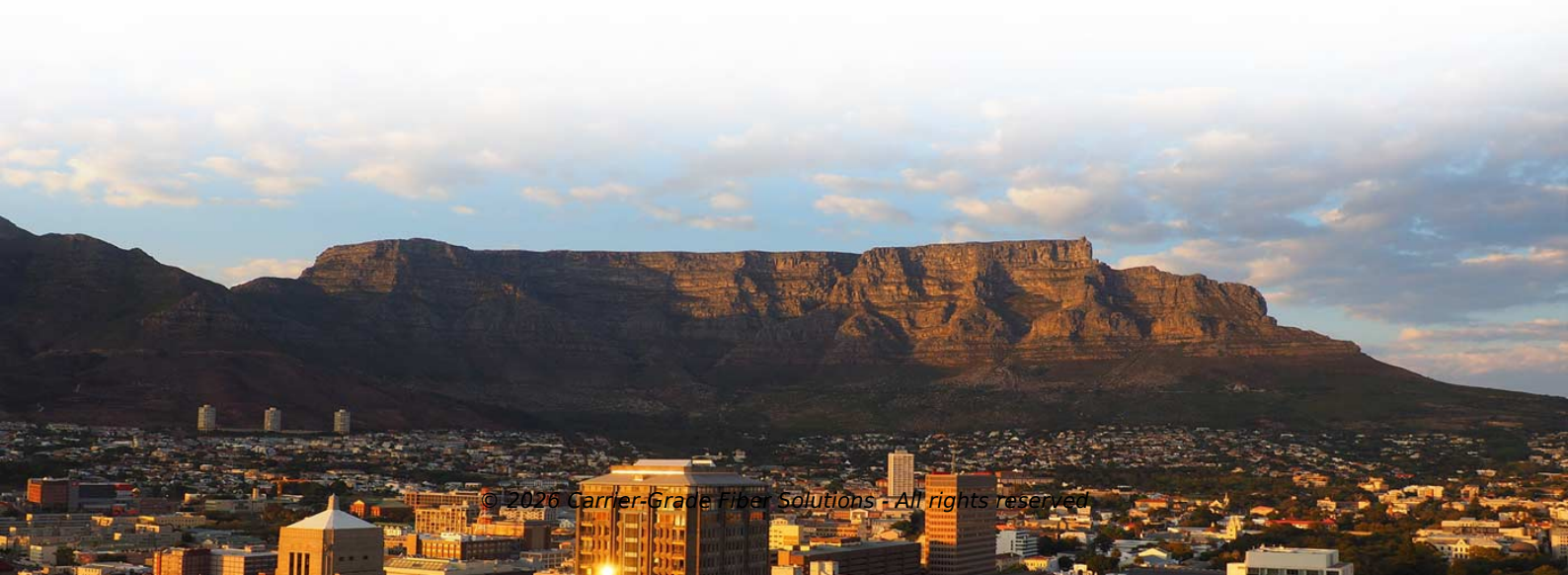
Fiber Optic Sensors for Mine Construction



Overview

Recent advances in Distributed Optical Fiber Sensing (DOFS) technologies, particularly Brillouin Optical Time Domain Analysis (BOTDA) and Rayleigh Optical Frequency Domain Reflectometry (ROTDR), have opened new pathways for real-time, high-resolution monitoring in mining. Recent advances in Distributed Optical Fiber Sensing (DOFS) technologies, particularly Brillouin Optical Time Domain Analysis (BOTDA) and Rayleigh Optical Frequency Domain Reflectometry (ROTDR), have opened new pathways for real-time, high-resolution monitoring in mining. The methodology involves embedding the sensing fiber into boreholes within the overlying strata and employing grouting to achieve effective coupling with the rock mass, a critical step that restores the in situ geological environment and ensures measurement reliability. Field validation at the. Managing an underground hard rock mine is an intricate engineering feat, requiring comprehensive oversight. It provides early warning signs of geotechnical failures, water ingress, and equipment malfunctions, allowing for timely intervention. The modulus as a function of depth showed the profile of the Excavation Damage Zone (EDZ). Although FBGs can be. Fiber optic technology is centered around the transmission of information as light pulses through strands of glass or plastic fibers.



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