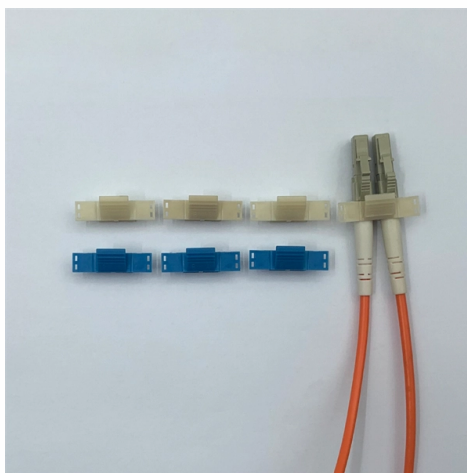


Automatic optical cable search



Overview

the present invention relates to a system and method for automatic discovery of an optical cable route, and the present invention belongs to the field of communication.

Key Takeaways

Automatic optical cable search involves using intelligent systems and monitoring tools to detect, track, and manage optical fiber routes and faults in real time, reducing manual intervention and improving efficiency.

Terrestrial Optical Cable Search

Modern optical networks use automatic discovery systems to manage cable routes and fiber cores efficiently. These systems typically involve: Configuration of cable routes: Physical site data is used to map deployed optical cables and their fiber cores into a network management system (NMS), including logical segments between sites for service allocation. Real-time monitoring: Power meters automatically measure optical power in fiber cores.

If the power exceeds predefined thresholds, alarms are generated at different levels (prompt, secondary, primary, urgent) to indicate potential faults. Automatic route search: When an alarm occurs, the system identifies affected routes and searches for available alternative paths that meet requirements for length and attenuation, enabling real-time service allocation. Intelligent locators: Devices like smart optical cable locators integrate OTDR, light sources, optical power meters, and cloud connectivity to identify cables and pinpoint faults non-destructively, significantly improving maintenance efficiency.



Subsea Optical Cable Search

For undersea cables, autonomous systems are used to detect and track cables on the ocean floor: Autonomous Underwater Vehicles (AUVs): Equipped with cameras, acoustic sensors, and laser scanning, AUVs can detect cables, map their paths in 3D, and maintain tracking even if cables are buried or displaced. Machine learning integration: AUVs use real-time image analysis to detect cables and generate waypoints for navigation, updating probabilistic maps to resume searches if tracking is lost. Rapid reporting: High-resolution surveys are processed onboard, producing compact summaries that can be transmitted remotely, avoiding the need for physical recovery.

Environmental monitoring: Subsea fiber-optic cables can also function as distributed sensors, detecting vibrations, seismic activity, or unauthorized intrusions using Distributed Fibre Optic Sensing (DFOS) technologies like Distributed Acoustic Sensing (DAS),.

Benefits of Automatic Optical Cable Search

Reduced manual labor: Automated systems replace time-consuming manual inspections and route verification. Real-time fault detection: Immediate alarms and route identification allow faster response to service disruptions. Optimized resource allocation: Systems can automatically select available routes for new services, improving network efficiency.

Non-destructive testing: Smart locators and AUVs avoid physical damage to cables while performing inspections. Enhanced reliability: Continuous monitoring and intelligent scheduling improve network resilience and reduce downtime. Automatic optical cable search technologies are increasingly critical for both terrestrial and subsea networks, enabling efficient, real-time management of complex optical infrastructures while minimizing human intervention and operational risks.

Article Content

US20180102837A1

the present invention relates to a system and method for automatic discovery of an optical cable route, and the present invention belongs to the field of communication.

Autonomous Subsea Cable Search and Tracking with Graph

This research develops a method that, given an approximate cable route map (or cable prior) enables a camera equipped AUV to search for and track exposed subsea communication cables while

Subsea Cable Search and Path Estimation Using Graph SLAM for

Abstract: This research develops a method to efficiently search for and track subsea communication cables using an Autonomous Underwater Vehicle (AUVs).

Automatic tracking method for submarine cables and pipelines of AUV ...

The proposed ACTM effectiveness and robustness were validated through numerical simulations and field tests. The results showed that the proposed method can achieve automatic

WO2016150204A1

The present invention relates to an automatic discovery method and system for an optical cable route.

Optical Cable Identifier with Vibration Detection and

This optical cable identifier detects signals and locates optical fibers with high sensitivity, featuring a 40km range and real-time data sharing.

Robotic intelligence for subsea cable inspection

To tackle these challenges, engineers at the University of Southampton developed real-time methods that allow AUVs to autonomously

Automatic Optical Cable Line Monitoring System-YOFC | Smart Link

By doing so, physical optical fibre networks can be monitored, marketed, maintained, and managed. With built-in optical protection, the system can perform real-time fault monitoring and periodic testing

Subsea cables as sabotage sensors and environmental

Subsea fibre-optic cables are being repurposed to not just to carry data, but also act as sensors capable of detecting sabotage and environmental disturbances.

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5 Trends Driving Fibre Optic Deployment in 2026 January 17 2026 16 min reading time The fiber industry has reached an inflection point. By the end of 2025, fiber broadband will pass over

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Optical fiber

An optical fiber, or optical fibre, is a flexible glass or plastic fiber that can transmit light from one end to the other. Such fibers are widely used in fiber-optic

Automatic Color Inspection for Colored Wires in Electric Cables

Abstract—In this paper, an automatic optical inspection system for checking the sequence of colored wires in electric cable is presented. The system is able to inspect cables with flat connectors differing

Automatic Color Inspection for Colored Wires in Electric Cables

Abstract and Figures In this paper, an automatic optical inspection system for checking the sequence of colored wires in electric cable is presented.

Automatic Optical Inspection System for Wire Color Sequence ...

This technology is a high-speed and highly accurate optical image inspection system that uses mechanical sensing equipment to replace the human eye as the inspection method and

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

