

DTU Optical Cable



Article Overview

DTU conducts advanced research on optical fiber cables for high-speed, energy-efficient, and quantum-secure data transmission.

Overview of DTU's Optical Cable Research

DTU (Technical University of Denmark) focuses on optical communication, which uses light to transmit data through fiber optic cables. Each fiber, as thin as a human hair, carries large amounts of data via a glass or plastic core, making it far more efficient than traditional copper cables. Optical fibers reduce energy consumption, transmit data faster, and are less susceptible to noise, which is crucial as global Internet traffic continues to grow .

Energy-Efficient Internet Initiatives

At DTU, the SPOC (Silicon Photonics for Optical Communications) research center explores ways to optimize Internet data transmission while reducing energy use. In 2012, researchers demonstrated that a single powerful laser chip could transmit over 600 terabytes per second through a single fiber, equivalent to twice the total global Internet traffic, replacing thousands of energy-intensive lasers. This work is part of the INCOM project, funded with DKK 60 million, aiming to make high-capacity, energy-efficient optical communication a reality .

Quantum-Encrypted Fiber Optic Transmission

DTU researchers have also advanced quantum-secure communication using fiber o...

Article Content

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Fiber Sensors & Supercontinuum

Fiber-optical sensors and imaging technologies are being increasingly employed in the fight against disease, environmental pollution,

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Solid-state Optics

Solid-state Optics The solid-state optics specialization focuses on engineering of light propagation and interactions between light and

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Researchers at DTU have successfully distributed a quantum-secure key using a method called continuous variable

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Specializations The MSc programme in Engineering Light provides two specializations. The students can focus on competences

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Light plays a crucial part in the development of future technologies – from modern medicine to climate-friendly methods of

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Career options

Career options The MSc in Engineering Light provides you with profound knowledge of optics and photonics as well as general

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100 kilometers of quantum-encrypted transfer | ScienceDaily

They have succeeded in using quantum encryption to securely transfer information 100 kilometers via fiber optic cable -

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Fundamentals of fibre-optic communication systems

To enable the student to 1. Describe physical working principles of components for optical communication systems and list relevant

Apr 01, 2026

The Guide to Understanding Optical Transport Networks

This guide provides a comprehensive data for understanding many facets of OTN. It includes the detailed OTN technology overview,

Apr 27, 2026

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The link is not affected by the surrounding air quality which could be the case with optical links. Sensor excitation using a non-contact

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Understanding the Multiple Layers of the OTN Network: ODU, OCh,

Learn how OTN layers — ODU, OCh, and WDM — enable efficient optical transport, multiplexing, and wavelength

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Robochameleon by dtu-dsp

The library includes physical models of most components found in coherent and incoherent optical communication systems, as well

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Handbook Optical fibres, cables and systems

The simultaneous availability of compact sources and of low-loss optical fibres led to a worldwide effort for developing optical fibre

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Nanolaser on a chip could cut computer energy use in half

Halving computers' energy use The internet already communicates data in the form of light particles on fiber optic

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Diffraction tensorized unit for million-TOPS general-purpose computing

Herein, we propose a fully reconfigurable diffraction tensorized unit (DTU) for million-TOPS general-purpose computing.

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High-Speed Optical Communications

In the High-Speed Optical Communications Group at DTU Electro we research how to enable the more and more essential cyber

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100 kilometers of quantum-encrypted transfer

The 100-kilometer fiber optic cable through which a team of researchers at DTU has successfully distributed a quantum

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Optical communication for the development of a green

Optical communication involves transporting data using light. The Internet works by sending data via

Nov 02, 2025

An Unprecedented 100 km – Researchers Set New Distance Record

Researchers at the Technical University of Denmark (DTU) have successfully utilized quantum encryption for the

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Instrumentations and Applications

Photonics: Instrumentations and Applications This technological specialization is aimed at students with interests in the

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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

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High-speed Communication

High-speed Communication specialization Design of communication systems and networks. The focus is optical communication and

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Quantum Encryption Integrates With Existing Infrastructure

The 100-km fiber optic cable through which a team of researchers at DTU has successfully distributed a quantum

Jan 06, 2026

Built-in resilience for Arctic subsea cables

Subsea cables with dedicated sensors will provide continuous data and thereby take Arctic research to an entirely

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