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## FEATURES OF OPTICAL FIBER SENSORS DIFFERENT FROM OTHER TYPES OF SENSOR SYSTEMS

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### ANNOTATION

This article provides information on the features of fiber optic sensors using fiber optic or sensitive element and features that differentiate fiber optic sensors from other types of sensor systems.

#### Key words

Optical fiber, concentration, technology, protection, security

### ОСОБЕННОСТИ ВОЛОКОННО-ОПТИЧЕСКИХ ДАТЧИКОВ, ОТЛИЧАЮЩИЕСЯ ОТ ДРУГИХ ТИПОВ СЕНСОРНЫХ СИСТЕМ

### АННОТАЦИЯ

В этой статье представлена информация об особенностях волоконно-оптических датчиков, использующих оптоволоконный или чувствительный элемент, а также об особенностях, которые отличают волоконно-оптические датчики от других типов сенсорных систем.

#### Ключевые слова

Оптическое волокно, концентрация, технология, защита, безопасность.

### ОПТИК TOLALI SENSORLARNI BOSHQA TURDAGI SENSOR TIZIMLARDAN FARQLI XUSUSIYATLARI

### ANNOTATSIYA

Ushbu maqolada optik tolali sensorlar optik tolali yoki sezgir elementdan foydalanish xususiyatlari va optik tolalari sensorlarni boshqa turdagi sensor tizimlardan farqli xususiyatlari haqida ma'lumot beriladi.

#### Kalit so'zlar

Optik tola, konsentratsiya, texnologiya, himoya, xavfsizlik



Due to the fact that fiber optic sensors use optical elements with a high level of sensitivity, it is used in the field of state border protection for the ability to record various changes with high accuracy. Fiber optic sensors use an optical fiber or sensing element. These sensors are used to sense some quantities such as temperature, pressure, vibrations, displacements, rotations or concentration of chemical species. Depending on the technical characteristics of these sensors, their field of application is different. However, regardless of operating conditions, devices show a constant level of accuracy when working with liquids or gases, solid or bulk materials.[1]. Optical sensors are in great demand, especially for industrial networks and connections. In particular, in mechanical engineering, metallurgy, aviation and chemical industries; used in transport, warehouse and mining equipment production; used to create weapons, heating devices, modern woodworking machines.

Today, fiber optic sensors are widely used not only in the security system, but also in taking measurements in other fields. Below are some of them.

- Mechanical measurements: (rotation, acceleration, electric/magnetic fields, temperature, acoustic, pressure, vibration, linear and angular position, strain, humidity, viscosity, etc.);
  - Chemical and biological sense;
  - Electric and magnetic measurements;
  - Monitor physical health of real-time regimes;
  - Construction and bridges: inspection and monitoring of deformations (crepe and compression, damage, damage assessment, neutral axis, concrete-steel interaction, etc.);
  - Dams: general expansion monitoring, spatial displacement, leakage monitoring, distributed temperature monitoring, etc.;
  - Myeros structures: relocation monitoring, seismic damage assessment, crack opening analysis, etc.;
  - Such as fixed leak detection.[3].

In fact, the fiber optic sensor system is important from the point of view of human activity as it provides continuous monitoring of the border area that requires additional attention. For example, if there is a need to increase activity in a certain remote place along the border for a week or a month, it is possible to maintain the security of the border by using additional technologies or personnel in this place. The fiber optic sensor system we aim to cover takes time and physical effort to a new technologically reliable level. Therefore, the combination of physical barriers with modern technologies serves as a factor of a successful approach to border security.



We know that Huawei's STO 83 technology in the modern security system has been actively used in security systems for various purposes. In this case, the user of the security system should contact the Uzbektelecom joint-stock company directly, and with the help of field employees, it will be possible to implement an alarm protection system in the protected area. It should be said that this work has been activated with the help of optical fibers.[4]. Of course, the development of existing technologies and techniques will increase the accuracy of activities and many conveniences. Below we present the initial technology used to provide protection. It works as one network with the security system. Through it, it is possible to constantly control the protection of the territory and quickly eliminate the existing malfunction.

The use of optical fiber sensors as devices for monitoring physical quantities requires high metrological properties from the devices. The devices are standard examples of technical means on the modern basis of optoelectronics, they are easily placed in microcontroller systems and are resistant to various noises. The devices differ in the methods of receiving information, using different methods of measurement and presenting information in different forms, but they are distinguished by reliable durability and stability in operation.[5]. Fiber Optic Sensors Perimeter Security, Underwater, Surface, Obstacle Detection, Fiber Optic Network, Airport Security, Nuclear Security, Government Security, Perimeter Security For Government, Fiber Optic Communication For Perimeter Security, Oil & Gas, Environment safety, pyrometer safety for water supply, pyrometer safety for treatment plants, pyrometer safety for water reservoirs, pyrometer safety for electric networks, pyrometer safety for small stations, pyrometer safety for chemical facilities, pyrometer safety of chemical plants, environmental security for plants, security for transport and railways, perimeter security for high security areas, perimeter security for ancient monuments, government buildings, perimeter security for the military, perimeter security for oil refineries, fence Perimeter security sensors for installation, barrier protection sensors, access detection for any obstacle, etc. are used for the security of many other areas.

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