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IEEE Standard for Fiber Optic Sensors—Fiber Bragg Grating Interrogator Standard—Terminology and Definitions

STANDARDS

IEEE Photonics Society

Developed by the
Standards Committee

IEEE Std 2067™-2021

IEEE

IEEE Standard for Fiber Optic Sensors—Fiber Bragg Grating Interrogator Standard—Terminology and Definitions

Developed by the

Standards Committee
of the
IEEE Photonics Society

Approved 9 February 2021

IEEE SA Standards Board

Abstract: The purpose of this standard is to clarify definitions so that ambiguity in specifications can be eliminated to facilitate broad usage of Fiber Optic Bragg grating sensors in a broad range of applications including smart civil structures, avionics, security, defense, environmental monitoring and medical diagnostics. Definitions and explanations of terms relating to the use of fiber Bragg grating interrogators are provided in this standard. It also offers a list of the key performance parameters needed to describe fully a Bragg grating-based sensor system and to allow the end user readily to compare systems from different suppliers for specific applications.

Keywords: Bragg gratings, distributed sensors, IEEE 2067™, pressure sensor, sensor interrogator, strain sensor, temperature sensor

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Introduction

This introduction is not part of IEEE Std 2067-2021, IEEE Standard for Fiber Optic Sensors—Fiber Bragg Grating Interrogator Standard—Terminology and Definitions.

Fiber optic sensing systems based on fiber Bragg grating sensors are becoming established in different sectors including the Oil and Gas industry, Structural Health Monitoring, civil engineering, medical, space, etc. The lack of common industry-wide specification and application practices is, however, holding back the mainstream commercial adoption of the technology. In order to address this problem, an IEEE/SEAFOM working group has been formed with a remit to produce agreed terminology and working practices for fiber Bragg grating (FBG) based interrogators.

This document addresses the first of the items in this remit by providing a definition of the terms commonly used by interrogator suppliers and a set of specification parameters which can be used to specify interrogator performance.

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IEEE Standard for Fiber Optic Sensors—Fiber Bragg Grating Interrogator Standard—Terminology and Definitions

1. Overview

1.1 Scope

The scope of this document is to provide definitions and explanations of terms relating to the use of fiber Bragg grating interrogators. It also offers a list of the key performance parameters needed to describe fully a Bragg grating-based sensor system and to allow the end user readily to compare systems from different suppliers.

Existing standards and definitions are used wherever possible. In addition, explicit links will be made between terms which are used commonly in internationally agreed metrology terminology.

1.2 Purpose

The purpose of this standard is to clarify definitions so that ambiguity in specifications can be eliminated to facilitate broad usage of Fiber Optic Bragg grating sensors in a multiplicity of applications including smart civil structures, avionics, security, defense, environmental monitoring and medical diagnostics.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).[1,2]

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

[1]The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.
[2]The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.