

IEEE Standard for Inertial Sensor Terminology

IEEE Aerospace and Electronics System Society

Developed by the
Gyro and Accelerometer Panel

IEEE Std 528™-2019

(Revision of
IEEE Std 528-2001)

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Developed by the

Gyro and Accelerometer Panel
of the
IEEE Aerospace and Electronics System Society

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IEEE SA Standards Board

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Abstract: Terms and definitions relating to inertial sensors are presented in this standard. Usage as understood by the inertial sensor community is given preference over general technical usage of the terms herein. The criterion for inclusion of a term and its definition in this standard is usefulness as related to inertial sensor technology.

Keywords: IEEE 528™, inertial sensor technology, inertial sensor terminology

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Introduction

This introduction is not part of IEEE Std 528-2019, IEEE Standard for Inertial Sensor Terminology.

IEEE Std 528-2019 is a minor revision of IEEE Std 528-2001. This standard is a listing of terms and definitions relating to inertial sensors. These terms and definitions represent a consensus of manufacturers and users in industry, government agencies, and other interested groups.

The criterion for inclusion of terms and definitions in this standard is their general usefulness as related to inertial sensor technology. When necessary, the needs of the inertial sensor community have been given preference over general technical usage. For example, “degree-of-freedom,” “rotor angular momentum,” and “pendulosity” are defined in a specialized sense, as applied to inertial sensors. In general, definitions that might be found in a standard textbook have not been included; for example, “damping ratio” and “orthogonality.”

In this standard, the symbol g is used to denote a unit of acceleration equal in magnitude to the local value of gravity at a test site or the standard value 9.80665 m/s^2 . The symbol g is thus distinguished from g which is the standard symbol for gram.

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IEEE Standard for Inertial Sensor Terminology

1. Overview

1.1 Scope

This standard provides a source of definitions of terminology used in the development, manufacture, and test of inertial instruments used for navigation, guidance, orientation, stabilization, and related applications. This is a companion document to IEEE Std 1559™.

1.2 Purpose

There is no consistent definition of terms that have arisen in the evolution of inertial instruments. This standard is intended to serve as a basic reference for producers and users of such instruments, for preparing industry standards, and for the interpretation of published technical reports.

2. Definitions

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.¹

acceleration-insensitive drift rate (gyro): The component of environmentally sensitive drift rate not correlated with acceleration.

NOTE—Acceleration-insensitive drift rate includes the effects of temperature, magnetic, and other external influences.²

acceleration random walk (accelerometer): *See: random walk (acceleration random walk).*

acceleration-sensitive drift rate (gyro): The components of systematic drift rate correlated with the first power of a linear acceleration component, expressed as (rad/s)/(m/s²) in SI units.³

¹*IEEE Standards Dictionary Online* is available at: <http://dictionary.ieee.org>

²Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.

³ More typically expressed as (°/h)/g or (°/s)/g.