

IEEE Standard for Low-Rate Wireless Networks

Amendment 1: Enhanced Ultra Wideband (UWB) Physical Layers (PHYs) and Associated Ranging Techniques

IEEE Computer Society

Developed by the
LAN/MAN Standards Committee

IEEE Std 802.15.4z™-2020
(Amendment to IEEE Std 802.15.4™-2020)

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Abstract: This amendment enhances the UWB PHYs with additional coding options and improvements to increase the integrity and accuracy of ranging measurements. It also enhances the MAC to support control of time-of-flight ranging procedures and exchange ranging related information between the participating ranging devices.

Keywords: amendment, double-sided two-way ranging, DS-TWR, enhanced ranging device, ERDEV, HRP UWB PHY, HRP-ERDEV, IEEE 802.15.4™, IEEE 802.15.4z™, low power, low-rate wireless networks, LRP UWB PHY, LRP-ERDEV, multi-node ranging, precision ranging, ranging device, RDEV, RF, RFID, real time location systems, RTLS, single-sided two-way ranging, SS-TWR, time of flight, TOF, TOF integrity, two-way ranging, TWR, ultra wideband, UWB, wireless specialty networks, WSN

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Introduction

This introduction is not part of IEEE Std 802.15.4z-2020, IEEE Standard for Low-Rate Wireless Networks—Amendment 1: Enhanced Ultra Wideband (UWB) Physical Layers (PHYs) and Associated Ranging Techniques.

This amendment of IEEE Std 802.15.4-2020 specifies enhancements and enhanced modes of operation for the HRP UWB PHY and the LRP UWB PHY and associated ranging techniques in the MAC. The PHY enhancements include facilities to improve the integrity and accuracy of the ranging measurements. The MAC enhancements include specification of information element definitions to facilitate ranging information exchange, and changes to support the PHY enhancements.

These enhancements meet the needs of a wider set of applications where the integrity and accuracy of distance measurement is important.

The standard is widely used in a variety of applications that employ the ranging capabilities enabled by the UWB PHYs specified by IEEE Std 802.15.4-2020. Current users and product manufacturers have identified the need for improved efficiency, integrity, and accuracy of the existing ranging measurement methods in order to expand the usefulness of the standard for applications such as RFID and automotive, in particular, automotive remote control, and similar personal devices. These enhancements are also expected to open up new areas of application.

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(This amendment is based on IEEE Std 802.15.4™-2020.)

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