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IEEE Standard for Information Technology—
Telecommunications and information exchange between systems
Local and metropolitan area networks—
Specific requirements

Part 22.1: Standard to Enhance Harmful Interference Protection for Low-Power Licensed Devices Operating in TV Broadcast Bands

IEEE Computer Society

Sponsored by the
LAN/MAN Standards Committee

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Abstract: This standard defines the protocol and data formats for communication devices forming a beaconing network that are used to protect low-power, licensed devices operating in television broadcast bands from harmful interference generated by license-exempt devices, such as Wireless Regional Area Networks (WRAN), intended to operate in the same bands. The devices being protected are devices licensed as secondary under Title 47, Part 74, Subpart H in the USA and equivalent devices in other regulatory domains.
Keywords: ad hoc network, beacons, TV white space, Wireless Regional Area Networks, WRAN

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Introduction

This introduction is not part of IEEE Std 802.22.1-2010, IEEE Standard for Information Technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 22.1: Standard to Enhance Protection for Low-Power, Licensed Devices Operating in Television Broadcast Bands.

This standard defines the protocol and data formats for communication devices offering enhanced protection for low-power, licensed devices, such as those used in the production and transmission of broadcast programs (i.e., devices licensed as secondary under Title 47, Part 74, Subpart H in the USA and equivalent devices in other regulatory domains), operating in television broadcast bands. Protection is provided through the use of a beacon, which contains information relevant to the licensed device, including its physical location and estimated duration of TV channel occupancy. The standard uses the ALOHA medium access mechanism, and all transmissions are broadcast.

The physical layer uses direct sequence spread spectrum (DSSS) with differential quadrature phase-shift keying (DQPSK). A synchronization word and countdown mechanism (i.e., time until the next beacon transmission) is transmitted continuously on the I channel, while beacons and inter device communications are transmitted on the Q channel. Frequency, modulation rate, and transmit power vary from region to region and shall adhere to local regulations.

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Part 22.1: Standard to Enhance Harmful Interference Protection for Low-Power Licensed Devices Operating in the TV Broadcast Bands

1. Overview

1.1 General

National regulators are advancing regulations that allow license-exempt devices to operate on a non-interfering basis within the portions of the TV spectrum that are not used for broadcasts or required to remain unused in order to protect broadcast stations from interference. The Federal Communications Commission (FCC) in the United States of America has proposed to allow license-exempt devices to operate on a non-interfering basis within the portions of the TV spectrum that are not used for broadcasts or required to remain unused in order to protect broadcast stations from interference. It is expected that other regulatory bodies will take similar actions. Although the TV channels in these portions are not used for TV broadcasts, low-power, licensed devices, such as wireless microphones operated by broadcasters, do use these channels, and are entitled to protection by regulation to avoid disrupting incumbent services.