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Title: Template Parameters of 4-ary PPM IR PHY

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Abstract

This document summarizes the parameters for 4-ary PPM to be possibly used in the IR PHY template.

Introduction

We believe that the choice of IR PHY should be based on technical merits, market concern, and integration with MAC. Consequently, 4-ary PPM is proposed as a candidate of IR PHY baseband modulation. This documentation is subject to further updation.

Summary of Parameters

Data Rate: 2M bps

Symbol Rate: 1M symbols per second (same as DS-PHY and FH-PHY)

Optical Power into Air: 16mW (average), 130mW (instaneous)

Transmission Radiation Angle: not less than 1.9 (solid angle)

Pulse Shape: TBD

Transmission Bandwidth: 0-5M Hz (15-20dB down?)

BER (normal): less than 10^{-6}

BER (minimal): less than 10^{-5}

Distance (diffused): not less than 8-10 m

Distance (direct path): not less than 20-30 m

FOV: TBD (larger than 3.14 solid angle)

Rx. Sensitivity: TBD (better than -30 dBm)

SYNC Pattern: TBD (0101 0101)

Preamble Length: TBD (no more than 4 bytes for synchronization overhead?)

MAC-PHY Interface: TBD

References:

[1] K.C. Chen, "Direct Detect Modulations of Indoor High Speed Diffused Infrared Transmission", submitted for publication.

[2] T.H. Tsaur, *et al.*, "A Nondirective Infrared Transceiver for Wireless Data Communications", *IEEE Tr. on Consumer Electronics*, Feb. 1994.