

**Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)**

**Submission Title:** [Discussion to facilitate expediting the selection of the PHY specification in TG4m]

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**Source:** [Daniel Popa, Hartman VanWyk, John Buffington, Roberto Aiello, Brent Caint, Matt Gilmore] [Itron, Inc]  
[Frank Poegel] [Atmel]  
[Anuj Batra, Timothy Schmidl] [TI]  
[Kuor-Hsin Chang] [Elster Solutions]  
[Henk de Rujiter] [Silabs]  
[Wei Hong, Gary Stuebing] [Cisco]  
[Ruben Salazar, Dave Olson] [Landis + Gyr]

E-Mail: []

**Abstract:** Discussion on the PHY specification in TG4m

**Purpose:** Facilitate expediting the selection of the PHY specification in TG4m

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# Outline

- Context of presentation
- A possible way expediting the selection of the PHY specification in TG4m
- Summary

# Context of Presentation

- This presentation aims at expediting the selection of the PHY specification in TG4m
- It provides a high level description on several key topics for the PHY specification in TG4m

# How TG4m can move forward

- TG4m PHY proposals derived from the 802.15.4g-2012 standard => 4g standard represents the common ground
- TG4m should consider fully re-using the good work done in 802.15.4g
  - 4g defines a range of modulations and data rates that can meet various application requirements
  - 4g defines multi-region PHYs that have enough flexibility to fit within “any” bandwidth and regulatory requirements
    - Channel spacing ranging from 200 kHz to 600 kHz (25/50 kHz for FSK in very narrow channels)
    - Data rates ranging from 50 kbps (and below) to 800 kbps
    - Variable transmission power limits
  - 4g defines mandatory mode and multiple optional modes that can meet both low cost and “high” cost implementations, while not decreasing the performance
  - 4g supports optional functionalities to increase reliability
    - FEC, data whitening, FHSS
  - 4g supports efficient network operation
    - Common signaling mode, Mode switch

# How TG4m can move forward (cont'd)

- We recommend that TG4m fully adopt and specify PHY modes as defined in 802.15.4g-2012 for
  - FSK PHY
  - OQPSK PHY
  - OFDM PHY
- We recommend that the TG4m deviates from 4g specification only when required to ensure regulatory compliance, as specified for the TVWS frequency band e.g.,
  - TV channel access requirements
  - Power levels
  - Out-of-band spurious emissions
  - Adapt channel plan
- We recommend that TG4m focuses on providing extensions to 802.15.4g-2012 to accommodate non SUN application requirements, without affecting the compatibility between the PHYs defined in 4g and PHYs defined in 4m/TVWS

# Summary

- 802.15.4g-2012 is an internationally recognized standard
  - Worldwide smart grid deployments using 802.15.4g (+ 802.15.4e MAC)
- The use of 802.15.4g-2012 “as is” in TVWS is one of the critical components for smart grids
  - Simply re-banding the 4g to TVWS would efficiently meet this requirement
- The fully adoption of 4g in TG4m facilitates mass production for chipset vendors
- Defining 4m PHYs that requires extensive re-design of existing 4g chipsets and/or systems will
  - Confuse the smart grid market and may prevent 4m from becoming a successful story
  - Add additional cost coming from FW development, test & validation
  - Add additional time-to-market for 4m technology