PHY Parameters List

Overview –

- Finally, this list will evolve to a reference that is useful for evaluating and comparing proposals

- For now, it's a list of things to be discussed, and where more work is needed.

The Environmental Context

- Channel Specifications – towards a baseline
    - Long-reach communication mode (1000 m)
    - Shorter-reach (and intrinsically safe) communication mode (200 m)
    - Channel Model (including connectors)
        - Frequency dependent
        - Maximum possible insertion loss within communication frequency range
        - Maximum possible return loss within communication frequency range

- Noise Models and Parameters
    - Crosstalk between signal lines and power/signal lines in automotive and industrial environments
        - Change of noise environment over time (e. g. when switching different loads, e. g. motors, on and off)
        - AWGN and in-band disturbers should come from the crosstalk and EMI models.
        - Duration and behavior of impulse noise events
    - Supply disturbance signature (in-band, out-band)
        - Maximum allowed in-band ripple voltage (frequency range, peak-to-peak values); Maximum allowed out-band ripple voltage (frequency range, peak-to-peak values, ramp rate outside the in-band frequency range, e.g. 20 dB/decade)
        - Maximum allowed change rate in current consumption (e. g. 10 mA/ms) of the device without disturbing communication
        - Startup behavior of a device (peak current, additional startup current, continuous current) to support device hot plugging within a daisy-chain
        - Link impulse noise tolerance

- Noise emission limits to meet EMC regulations

Design Evaluation

- Design Details
    - Line coding
    - Signal amplitudes (inc. trim capability)
    - Signal frequency range
    - Symbol synchronization
    - Signal forming
    - Termination

- Powering options and flexibility

- Power dissipation constraint
    - A consideration affecting how many devices can be used for a constrained power infrastructure
    - Power down modes and energy efficiency

- Echo cancellation specification
    - Maximum allowed return loss
    - Linearity requirements

- Diagnostics implementation (what, how, when)?
    - This might happen during training

- Link-up time constraint

- Latency
    - Constant latency
    - Latency Jitter

- Auto-negotiation