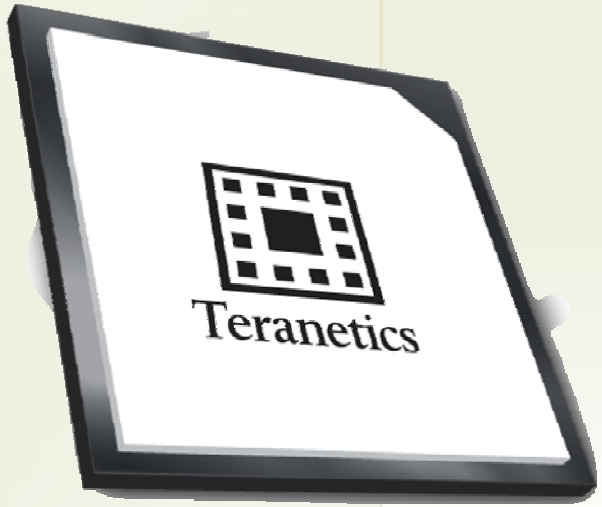

Annex of the 10GBASE-T EEE Alert signal proposal

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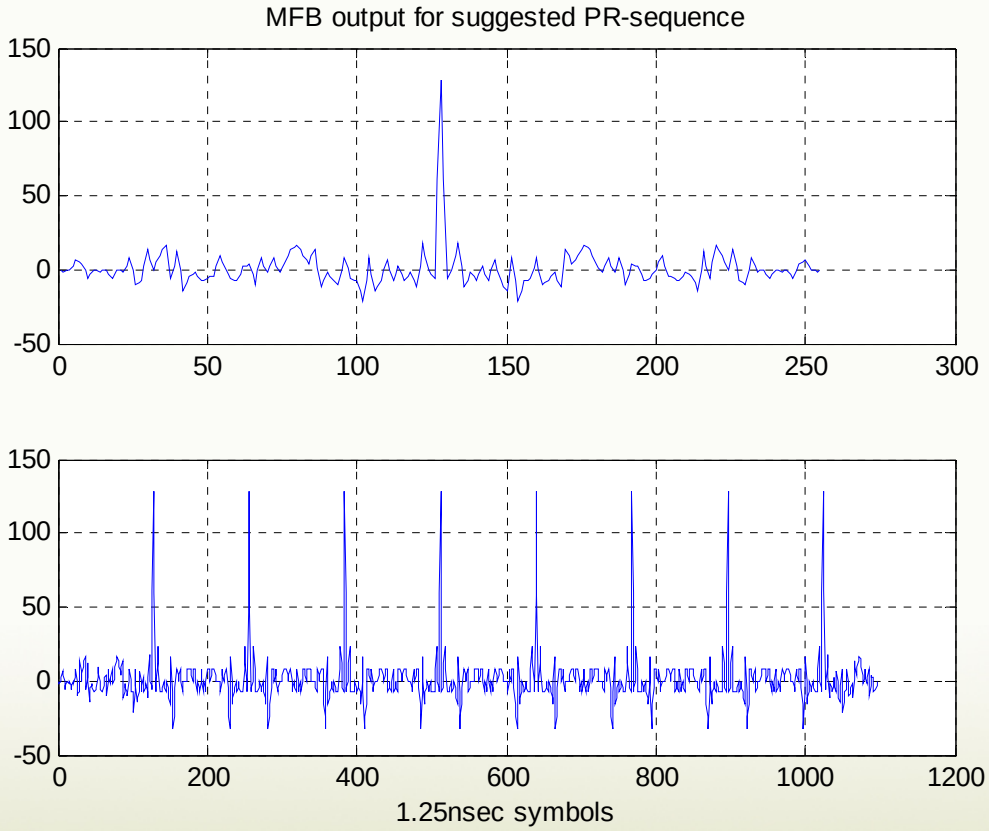
Sept 13, 2008

Teranetics

Estimated MFB response



Implementations considerations

- MFB can be implemented as ideal integrator (single adder)
- Peak detector can be implemented as 2-inputs comparator
- Resetting / synchronization is trivial as it follows natural LDPC frame boundaries
- Single Lane implementation eliminates a need for switching on/off receive lanes (unless needed for adaptation purpose)
- Using different sequences for Master and Slave provides adequate margin against false-alarm detection in asymmetrical scenario
  - Master/Slave patterns are reversed – so single 128-bits ROM can be used.

Noise budget analysis

- Using MFB (matched filter bound) on known PAM2 pattern allows sequence detector implementation and “arithmetic” SNR gain versus “Geometric” SNR for single-symbol detection technique
  - At 100m, Norm(‘Alert pattern’➔IL)= -14dB relative to tx level
- For worst case impairments weighted by alert pattern spectrum:
  - Norm (‘noise’ = RL+NEXT+FEXT, etc) ~ -10dB to tx level
- Processing gain: 30dB (24dB for each LDPC frame, 3 more dB’s for each doubling of frames.
- From above, SNR_{MFB} (Alert=ON/OFF) ~ 26dB
- Overall above gain should be enough for better then 1e-25 of miss detection without any Echo Can, NEXT, FEXT or EQ
  - Even in the asymmetrical case with LPI only in one direction.
  - Margin could be improved by partial Echo Cancellation