Proposed update of Coefficient Initial Conditions (Table 179-8 and 176D-8)

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Supporters

- Leon Bruckman, Nvidia

- Mike Dudek, Marvell

Review of Current Coefficient Initial Conditions

Table 179-8 and 176D-8 are similar

Table 179–8—Coefficient initial conditions

Coefficient update state	ic_req	$c(-3)$	$c(-2)$	$c(-1)$	$c(0)$	$c(1)$
OUT_OF_SYNC[a]	N/A	0	0	0	1	0
NEW_IC	preset 1[a]	0	0	0	1	0
	preset 2	0 ± 0.025	0 ± 0.025	0 ± 0.025	0.5 ± 0.025	0 ± 0.025
	preset 3	0 ± 0.025	0 ± 0.025	−0.075 ± 0.025	0.75 ± 0.025	0 ± 0.025
	preset 4	0 ± 0.025	0.05 ± 0.025	−0.2 ± 0.025	0.75 ± 0.025	0 ± 0.025
	preset 5	−0.025 ± 0.025	0.075 ± 0.025	−0.25 ± 0.025	0.65 ± 0.025	0 ± 0.025

[a] Preset 1 is the reference for the calculation of the normalized coefficients of the transmit equalizer (see 179.9.4.1.1). As a result, the normalized coefficients for preset 1 and OUT_OF_SYNC do not include any tolerances.

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Paraphrased comments on table(s) in draft 1.3

- Note that preset 1 to preset 2 is a coarse adjustment (comment D1.3 457 Simms)
- Preset 1 is used for default measurement setup (comment D1.3 514 Dawe)
  - Preset 1 is the highest setting
  - Preset 1 is highest xtalk
  - 50G/lane and 100G/lane may exceed the 900mV limit when connected to 200G/lane AUI
  - C2C, C2M, CR, and KR can be aligned for convenience
- Values of Preset 1 are also used for OUT_OF_SYNC (Comment D1.3 514 Dawe)
- C2M receivers may be overloaded on short links at start of transmitter training
  - Propose lower C(0) to 0.5 for OUT_OF_SYNC
  - Comment D1.3 425 Dudek
- 1V amplitude peak-to-peak signal possible from compliant transmitter
  - May overload RX making it incapable of reducing amplitude through training protocol
  - Propose lower C(0) to 0.8 for OUT_OF_SYNC in table 179-8
  - Similar changes in Clause 179 and Annex 176C
  - Comment D1.3 426 Dudek

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Proposal

- Add a preset to the table with C0 set to 0.75 and no precursor or postcursor tap weights (0 0 0 0.75 0)

- Suggest to make the above value for Preset 1 and OUT_OF_SYNC

- Allocate current preset 1 values C0 (1) or (0 0 0 1 0) to another preset number

- Change the note under the table to reference the new preset number
  - The second line of the footnote is open to debate

- Alternate suggestion to change only OUT_OF_SYNC to a lower value and leave preset 1 a different value possibly unchanged
  - Discussion OUT_OF_SYNC may be different values in 179-8 vs 176D-8

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A proposed edit to tables 179-8 and 176D-8

Coefficient update state	ic_req	c(-3)	c(-2)	c(-1)	c(0)	c(1)
OUT_OF_SYNC	N/A	0 ±0.025	0 ±0.025	0 ±0.025	0.75 ±0.025	0 ±0.025
NEW_IC	preset 1	0 ±0.025	0 ±0.025	0 ±0.025	0.75 ±0.025	0 ±0.025
	preset 2	0 ±0.025	0 ±0.025	0 ±0.025	0.5 ±0.025	0 ±0.025
	preset 3	0 ±0.025	0 ±0.025	-0.075 ±0.025	0.75 ±0.025	0 ±0.025
	preset 4	0 ±0.025	0.05 ±0.025	-0.2 ±0.025	0.75 ±0.025	0 ±0.025
	preset 5	-0.025 ±0.025	0.075 ±0.025	-0.025 ±0.025	0.65 ±0.025	0 ±0.025
	preset 6	0	0	0	1	0

Preset 6 is the reference for the calculation of the normalized coefficients of the transmit equalizer (see 179.9.4.1.1). As a result, the normalized coefficients for preset 6 do not contain any tolerances

Another proposed edit to tables 179-8 and 176D-8

Coefficient update state	ic_req	c(-3)	c(-2)	c(-1)	c(0)	c(1)
OUT_OF_SYNC	N/A	0 ±0.025	0 ±0.025	0 ±0.025	0.75 ±0.025	0 ±0.025
NEW_IC	preset 1	0	0	0	1	0
	preset 2	0 ±0.025	0 ±0.025	0 ±0.025	0.5 ±0.025	0 ±0.025
	preset 3	0 ±0.025	0 ±0.025	-0.075 ±0.025	0.75 ±0.025	0 ±0.025
	preset 4	0 ±0.025	0.05 ±0.025	-0.2 ±0.025	0.75 ±0.025	0 ±0.025
	preset 5	-0.025 ±0.025	0.075 ±0.025	-0.025 ±0.025	0.65 ±0.025	0 ±0.025

Preset 1 is the reference for the calculation of the normalized coefficients of the transmit equalizer (see 179.9.4.1.1). As a result, the normalized coefficients for preset 1 do not contain any tolerances

Additional changes to text may be required

To replace preset 1 used elsewhere in spec

- 179.9.4.1.1 Linear fit to the measured waveform

- 179.9.4.1.2 Steady-state voltage and linear fit pulse peak ratio

- 179.9.5.3.3 Test channel calibration

- 179.9.5.3.5 Test procedure

- 176D.7.11 Amplitude tolerance

- 176D.7.12.2 Noise calibration

- 176D.7.12.4 Test procedure

Presets mapped to function/purpose
Note the format change

- Here I show 3 values of preset which are unnamed with varying values of C(0) 0.5, 0.75, and 1

- These 3 values can be assigned 'Default', 'Analog Measurement', or 'other preferred values'

- The other 3 values of preset are named and are 'other preferred values'

Purpose	ic_req	c(-3)	c(-2)	c(-1)	c(0)	c(1)
default	preset	0 ±0.025	0 ±0.025	0 ±0.025	0.5 ±0.025	0 ±0.025
default	preset	0 ±0.025	0 ±0.025	0 ±0.025	0.75 ±0.025	0 ±0.025
Analog Measurement	preset	0	0	0	1	0
Other setting	preset 3	0 ±0.025	0 ±0.025	-0.075 ±0.025	0.75 ±0.025	0 ±0.025
Other setting	preset 4	0 ±0.025	0.05 ±0.025	-0.2 ±0.025	0.75 ±0.025	0 ±0.025
Other setting	preset 5	-0.025 ±0.025	0.075 ±0.025	-0.025 ±0.025	0.65 ±0.025	0 ±0.025

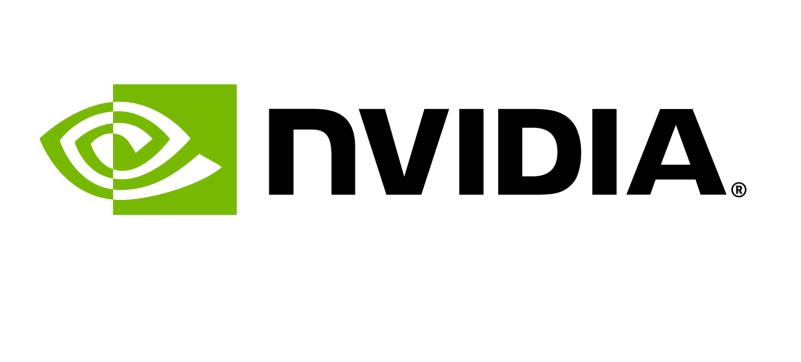IEEE P802.3dj 200 Gb/s, 400 Gb/s, 800 Gb/s, 1.6 Tb/s Ethernet Task Force

Discussion

- General agreement in consensus building that OUT_OF_SYNC value should be lowered
  - Is 0.75 sufficient for all cases or should we consider 0.5?
  - Should we change this to be Preset 0?

- General agreement that we need a preset between current preset 1 and preset 2
  - Desire not to add an additional preset and extend test time, so do we change an existing one?
  - Would preset 0 = OUT_OF_SYNC setting address both concerns?

- For consensus building heading into the F2F, I'd like to understand if we have agreement on some of the items above

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Thank You

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Backup

Impact of presets for a given Vf

Preset	D1.2 min (V)	D1.2max (V)	D1.3 min (unchanged) (V)	D1.3 max (V)
1 C0(1)	0.4	0.6	0.4	0.5
2 C0(0.5)	0.2	0.3	0.2	0.25
3 (0.675)*	0.27	0.405	0.27	0.3375
Proposed C0(0.75)	0.3	0.45	0.3	0.375

Sum of un-normalized tap weights adjustment request based on compliant TX range of Vf
*Preset 3 is 0.75-0.075= 0.675