Amplification on comment 277

also bearing on

Comments 152 and 247

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Both 94.3.12.6 and 94.3.12.9 use the linear fit pulse method from Clause 85 but with insufficient information to use the method in the context of Clause 94.

In 94.3.12.6 the standard should describe how to use the method from Clause 85 including enough information to do it correctly in a Clause 94 context, then reference 94.3.12.6 in 94.3.12.9.

Starting with 94.3.12.6:

Delete the text on page 249 starting on line 42:

“The transmitter output waveform is characterized using the procedure described in 85.8.3.3. The parameters of the linear pulse fit and equalizer are summarized in Table 94–14”

Replace it with:

“1) The transmitter under test is preset as specified in 72.6.10.2.3.1 such that c(–1) and c(1) are zero and c(0) is its maximum value.
2) Capture at least one complete cycle of the training pattern described in 94.3.10.8 at TP2 per 85.8.3.3.4.
3) Compute the linear fit to the captured waveform and the linear fit pulse response p(k) per 85.8.3.3.5. For aligned symbol values x(n) use -1, -1/3, 1/3, 1 to represent symbol values of 0, 1, 2, 3 respectively.

The parameters of the pulse fit and the equalizing filter are given in Table 85–6. The DC amplitude, the sum of linear fit pulse response, p(k), from step 3) divided by M from step 3), shall be greater than 0.40 V and less than or equal to 0.6 V. The peak of the linear fit pulse response from step 3) shall be greater than 0.85 × DC amplitude.

(continued on next slide)

4) Define tx to be the time where the rising edge of the linear fit pulse, p, from step 3) crosses 50% of its peak amplitude.
5) Sample the linear fit pulse, p, at symbol-spaced intervals relative to the time t0 = tx + 0.5 UI, interpolating as necessary to yield the sampled pulse pi.
6) Use pi to compute the vector of coefficients, w, of a Nw-tap symbol-spaced transversal filter that equalizes for the transfer function from the transmit function to TP2 per 85.8.3.3.6.

For each configuration of the transmit equalizer

7) Configure the transmitter under test as required by the test.
8) Capture at least one complete cycle of the training pattern as described in 2)
9) Compute the linear fit to the captured waveform and the linear fit pulse response p(k) as in 3)
10) Define tx to be the time where the rising edge of the linear fit pulse response, p(k), from step 9 crosses 50% of its peak amplitude.
11) Sample the linear fit pulse response, p(k), at symbol-spaced intervals relative to the time t0 = tx + 0.5 UI, interpolating as necessary to yield the sampled pulse pi.
12) Equalize the sampled pulse pi using the coefficient vector, w, computed in step 6) per 85.8.3.3.6 to yield the equalized pulse qi.

The normalized amplitude of coefficient c(–1) is the value of qi at time t0 + (Dp – 1) UI. The normalized amplitude of coefficient c(0) is the value of qi at time t0 + Dp UI. The normalized amplitude of coefficient c(1) is the value of qi at time t0 + (Dp + 1) UI.

In Clause 94.3.12.9:

Replace the text in 94.3.12.9 on pages 252 and 253 beginning on line 36:

“Transmitter output linearity is determined using the following procedure:”

With:

“Compute the linear fit to the captured waveform and the linear fit pulse response p(k) per 94.3.12.6.

Calculate the standard deviation, σe(p), for each phase, p, of the error e(p+j*M). This is the output noise and distortion error.

Call 1/3 the peak of the pulse response S, the signal.

$$SNDR = S/maximum(\sigma e(p))$$ 94-xx”

It would also be a good idea to change:

“Signal to noise and distortion ratio (SNDR) measured at the transmitter output using the methodology described in this sub-clause shall be greater than 19 dB.”

to:

“For any allowed setting of c(-1), c(0), and c(1), Signal to noise and distortion ratio (SNDR) measured at the transmitter output using the methodology described in this sub-clause shall be greater than 19 dB.”

These changes are likely to be disruptive to the flow of the standard. I recommend that the editor make full use of his editorial license to rearrange text to improve the flow.