

Adding Tcdr to D1.5

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□ From 802.3av (10G EPON):

- Tcdr is defined in 76.4.2.1
- It's also called out in 75.7.14 (Laser on/off timing measurement) where its value is noted as 400ns

76.4.2 Extensions for 10GBASE-PR-D and 10/1GBASE-PRX-D

→ 76.4.2.1 CDR lock timing measurement for the upstream direction

CDR lock time (denoted T_{CDR}) is defined as a time interval required by the receiver to acquire phase lock on the incoming data stream. T_{CDR} is measured as the time elapsed from the moment when the electrical signal after the PMD at TP8, as illustrated in Figure 75–3, reaches the conditions specified in 75.7.15 for receiver settling time to the moment when the signal phase is recovered and jitter is maintained for a network with BER of no more than 10^{-3} .

A PMA instantiated in an OLT becomes synchronized at the bit level within 400 ns (T_{CDR}) after the appearance of a valid synchronization pattern (as defined in 76.3.2.5.2) at TP8.

→ 76.4.2.1.1 Test specification

The test of the OLT PMA receiver T_{CDR} time assumes that there is an optical PMD transmitter at the ONU with well known T_{on} time as defined in 75.7.14, and an optical PMD receiver at the OLT with well-known $T_{\text{receiver_settling}}$ time as defined in 75.7.15. After $T_{\text{on}} + T_{\text{receiver_settling}}$ time, the parameters at TP8 reach within 15% of their steady state values, measure T_{CDR} as the time from the TX_ENABLE assertion, minus the known $T_{\text{on}} + T_{\text{receiver_settling}}$ time, to the time the electrical signal at the output of the receiving PMA reaches up to the phase difference from the input signal of the transmitting PMA assuring BER of 10^{-3} , and maintaining its jitter specifications. The signal throughout this test is the synchronization pattern, as illustrated in Figure 76–14.

- ❑ Tcdr should probably be defined in close proximity to Laser on/off & $T_{\text{Receiver Settling}}$ definitions
- ❑ Relevant section of outline from D1.5:

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- ❑ Creating a section 141.7.15 to define Tcdr looks like a good fit...

Tcdr - Proposed 141.7.15 new sub-clause

□ Proposed new text:

141.4.15 T_{CDR} measurement

141.4.15.1 Definitions

CDR lock time (denoted T_{CDR}) is defined as a time interval required by the receiver to acquire phase lock on the incoming data stream. T_{CDR} is measured as the time elapsed from the moment when the electrical signal after the PMD at TP8, as illustrated in Figure 141-3, reaches the conditions specified in 141.7.14 for receiver settling time to the moment when the signal phase is recovered and jitter is maintained for a network with BER of no worse than 10^{-2} .

A PMA instantiated in an OLT becomes synchronized at the bit level within 400 ns (T_{CDR}) after the appearance of a valid synchronization pattern (as defined in 142.1.3) at TP8.

141.15.2 Test specification

The test of the OLT PMA receiver T_{CDR} time assumes that there is an optical PMD transmitter at the ONU with well known T_{on} time as defined in 141.7.13, and an optical PMD receiver at the OLT with well-known $T_{\text{receiver_settling}}$ time as defined in 141.7.14. After $T_{\text{on}} + T_{\text{receiver_settling}}$ time, the parameters at TP8 reach within 15% of their steady state values, measure T_{CDR} as the time from the TX_ENABLE assertion, minus the known $T_{\text{on}} + T_{\text{receiver_settling}}$ time, to the time the electrical signal at the output of the receiving PMA reaches up to the phase difference from the input signal of the transmitting PMA assuring BER of 10^{-2} , and maintaining its jitter specifications. The signals transmitted throughout this test are the SP1 and SP2 patterns as illustrated in Figure 142-3, or the SP1, SP2, & SP3 patterns as illustrated in Figure 142-4.