

# PCS Modes for PMD Testing: Square-wave and PRBS31

**Jeff Mandin  
Valentin Ossman  
PMC-Sierra**

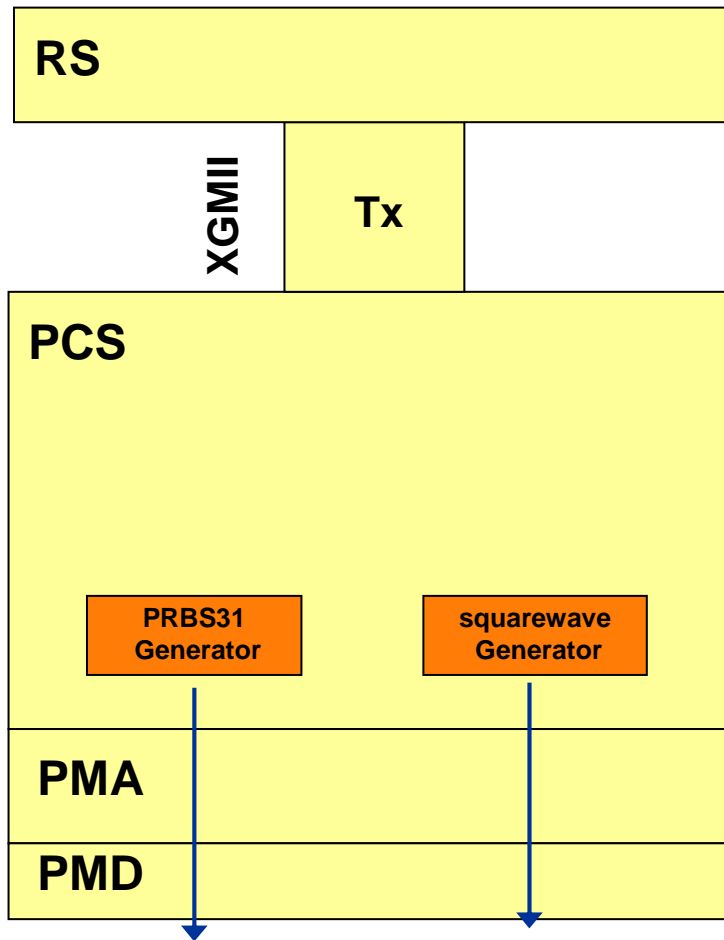
**IEEE 802.3av  
Atlanta  
Nov 2007**

## Background

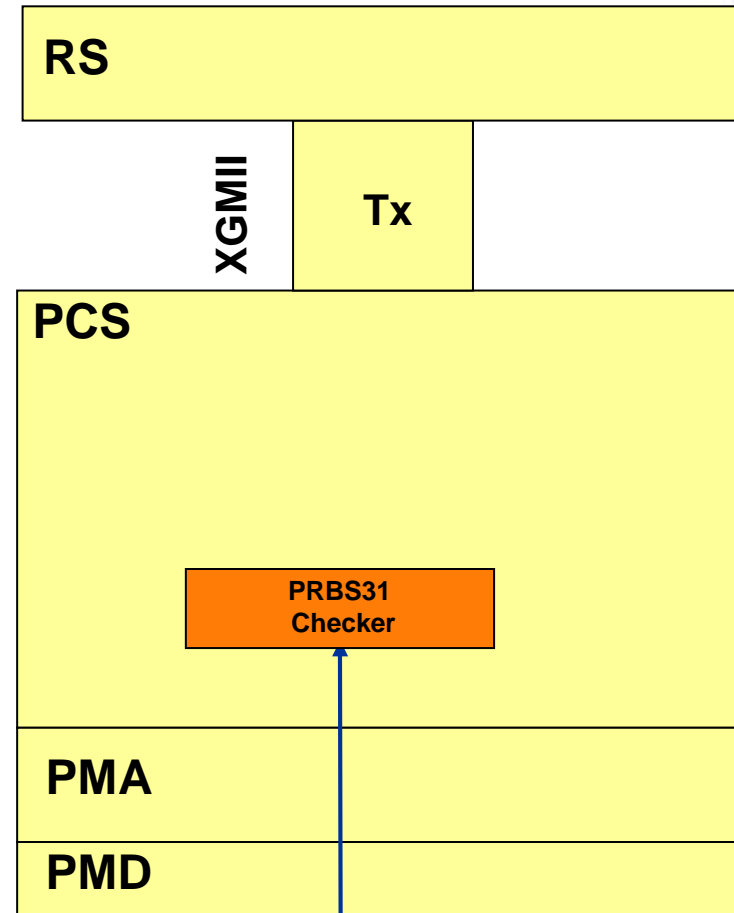
1. Several test pattern modes are defined for 10GBASE-R:
  - a) Pseudo-random test pattern
  - b) Square-wave test pattern
  - c) PRBS31 test pattern (implementation in 10GBASE-R is optional)
2. *Square-wave* and *PRBS31* modes are also present in 802.3ap/an and are desirable in 10GEAPON.
3. Clause 52.9 PMD conformance tests (and UNH PMD conformance tests) use square-wave and optionally use PRBS31.

# Logical stack

Tx



Rx



## Square-wave Test Pattern Mode

1. Square wave test pattern consists of alternating runs of '1' and '0'
2. Run length is between 4 and 11 bits long (configured via MDIO)
3. Square wave mode is supported in the transmitting PCS only
  - there is no “checker” function defined in a receiving PCS
  - used for testing the transmitting PMD only
  - Test equipment is used to measure optical amplitude, ER etc.
4. Within the PCS, the test pattern generator communicates directly with the PMA
  - No other PCS functions involved

## PRBS31 Test Pattern Mode

1. PRBS31 test pattern is optional in 10G serial (also in other 10G)
  - Support is desirable because PRBS31 transmitters/checkers are commonly present in BERTs and similar test equipment
2. Transmitting PCS includes a PRBS31 generator
  - used for testing optical parameters of the transmitting PMD
3. Receiving PCS includes a PRBS31 checker
  - used for checking performance of analog receiver
4. Within the PCS, the test pattern generator/checker communicate directly with the PMA
  - No other PCS functions involved

## Straw Poll

10GEPON should include support for Square-wave test mode and optional support for PRBS31 test mode

Y

\_\_\_\_\_

N

\_\_\_\_\_

No opinion

\_\_\_\_\_