

Ethernet-APL Test Guide

Test Type (Data or Power): Data

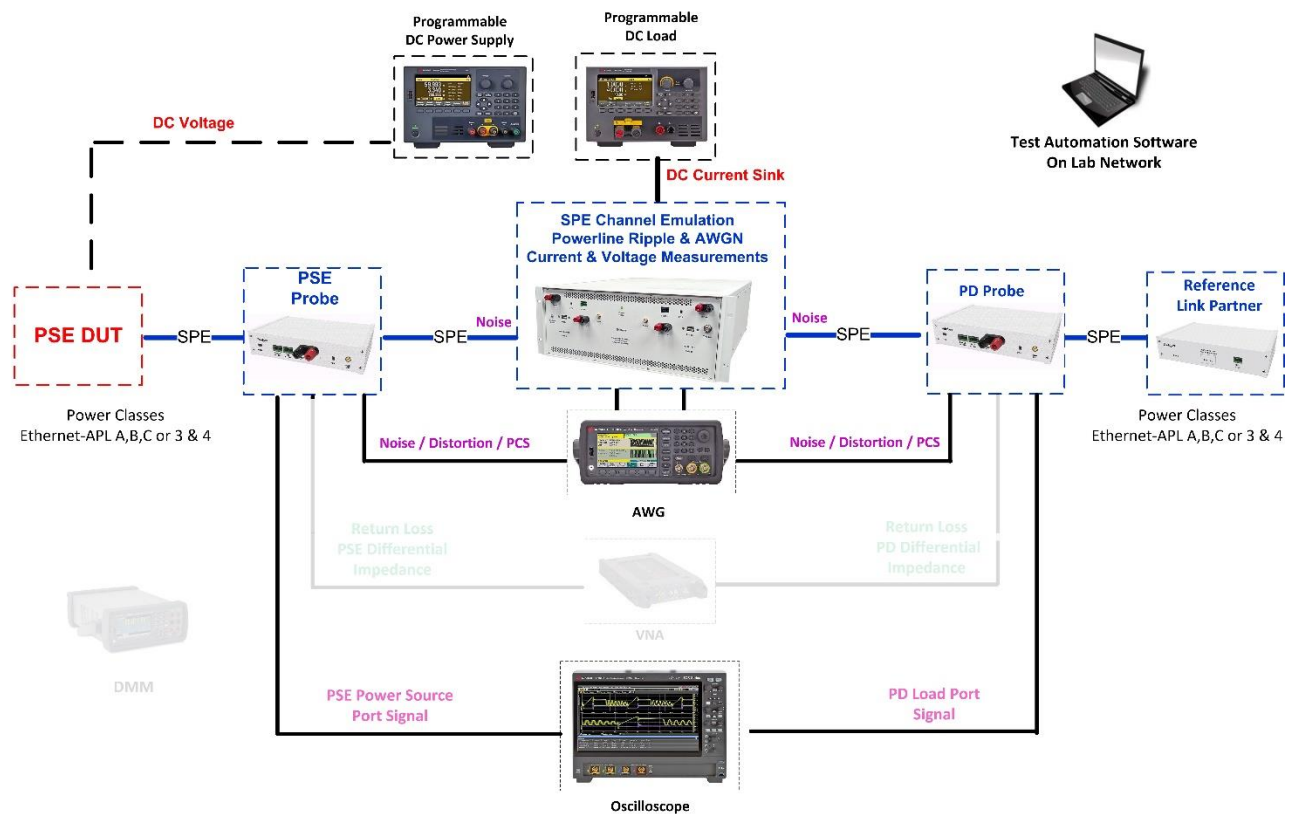
Test Name: 98.1.3 Link Status Fail

Purpose/Description: To verify that the Ethernet-APL Device detects link_status [10BASE-T1L] = FAIL.

Required Test Equipment for PSE:

1. PD Probe
2. 4950 Channel Emulator (for current measurements)
3. PSE Probe
4. Programmable DC Power Supply (to power the PSE DUT)
5. Programmable DC Load (to draw current from PSE DUT)
6. AWG
7. Oscilloscope
8. Test Automation Software
9. Telebyte Model 4925 Link Partner

Test Setup / Connection Diagram (PSE):

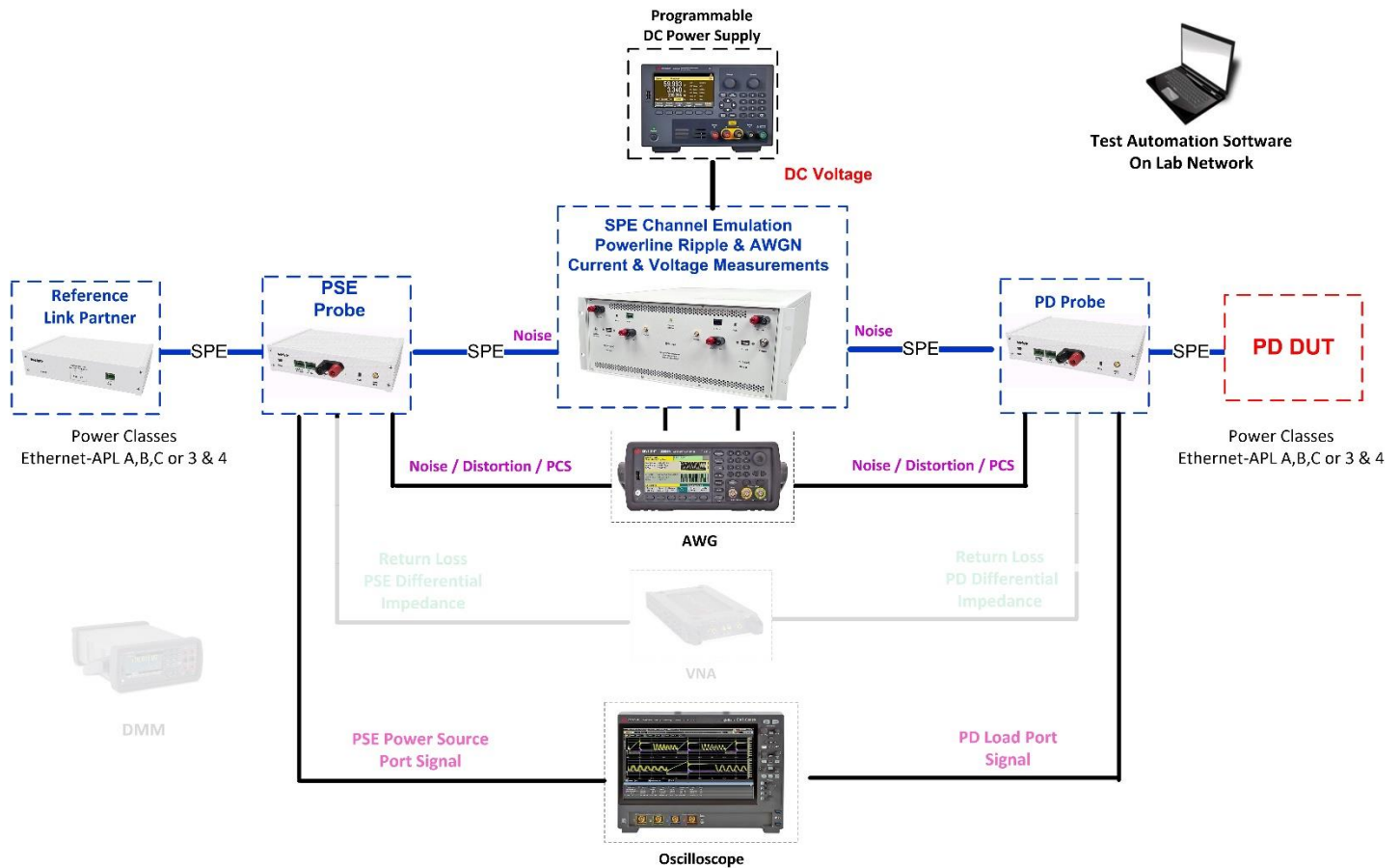


Ethernet-APL Test Guide

Required Test Equipment for PD:

1. PD Probe
2. 4950 Channel Emulator (for current measurements)
3. PSE Probe
4. Programmable DC Power Supply (to power the PD Load DUT)
5. AWG
6. Oscilloscope
7. Test Automation Software
8. Telebyte Model 4925 Link Partner

Test Setup / Connection Diagram (PD):



Ethernet-APL Test Guide

Device Under Test Setup:

- DUT as 10BASE-T1L default configuration and enable auto-negotiation.
- Note if the DUT is a Trunk or a Spur Port.
- Enter the Power Class for the Device Under Test (Trunk: Class 3 or 4, Spur: Class A, B or C) into the test automation software.
- A test station capable of Auto-Negotiation, 10BASE-T1L link signaling, and arbitrary packet generation and capturing and decoding ternary symbols. Test stations must be either Option 1B (Figure C.2) or Option 2 (Figure C.3) with test setup as noted below.
- A line-monitoring system capable of decoding Auto-Negotiation DME pages.
- Link Partner test station with controllable 1.2249.14 bit (10BASE-T1L Transmit Disable).

Expected Results (Pass/Fail Criteria):

Part A: DUT receives no valid 10BASE-T1L signaling in Auto-Negotiation (AN) GOOD CHECK state.

Step	Status	Description
A:2	PASS	Following detection of link_status[10BASE-T1L] = FAIL, the DUT properly resumes DME transmissions, and can properly link. No detectable violations of link_fail_inhibit_timer[10BASE-T1L] or break_link_timer[LSM] were observed.
A:1	FAIL	The DUT is not observed to restart Auto-Negotiation after it detects link_status[10BASE-T1L] = FAIL.
A:1	FAIL	If the DUT is MASTER and does not transmit 10BASE-T1L link signaling (MASTER training signaling).
A:1	WARN	If the DUT is MASTER and does not send MASTER training signaling for at least 2430.4 ms. This time is 80% of the minimum value of link_fail_inhibit_timer[10BASE-T1L] {3030 ms} (an arbitrary accuracy limit selected for this test). Issued as a WARN as the DUT may issue a PHY Reset (eg: mr_main_reset) at any time.
A:1	FAIL	If the DUT is MASTER and sends MASTER training signaling for more than 3090 ms.
A:1	FAIL	If the DUT is MASTER, and after ceasing MASTER training signaling, the DUT resumes sending DME pages within 6.4 ms, violating break_link_timer[LSM], which is nominally 8 ms to 8.133 ms. 6.4 ms is 80% of the minimum value of break_link_timer[LSM] (an arbitrary accuracy limit selected for this test). Note that the idle gap between MASTER training signaling cessation and DME page transmission may exceed the maximum of one break_link_timer[LSM] as many events (e.g., mr_main_reset) may cause the timer to restart.

Notes:

References:

- [1] IEEE Std. 802.3-2022 subclause 98 (Auto-Negotiation for single differential-pair media)
- [2] IEEE Std. 802.3-2022 Figure 98-7 (Arbitration state diagram)
- [3] IEEE Std. 802.3-2022 subclause 98.5.2 (break_link_timer_[LSM])
- [4] IEEE Std. 802.3-2022 subclause 98.5.2 (link_fail_inhibit_timer_[HCD])