

# 4PID – Proposed Baseline Text

IEEE 802.3: 4PPOE Task Force

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# Baseline Text Proposal (variables -1)

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## 33.2.4.4 Variables

### **Add new variables as follows:**

- both\_alts\_valid** This variable is provided for Type 3 and Type 4 PSEs.  
Values: TRUE – do\_detection yields “valid” on both pair-sets  
FALSE – do\_detection does not yield “valid” on both pair-sets
- PD\_signature** This variable is provided for Type 3 and Type 4 PSEs to determine whether the two pair-sets are connected to a single signature or a dual signature PD.  
Values: **SINGLE:** A single signature PD configuration is connected through the two pair-sets at the PI.  
**DUAL:** A dual signature PD configuration is connected to the two pair-sets  
**INVALID:** Either the connection check has not yet been performed or the results of the check are inconclusive, e.g., due to open circuit.

*Editor’s Note (to be removed prior to publication): These definitions need to be refined by comments. These should be reviewed as connection check text is adopted, and appropriate definitions for concepts such as single/dual signature PD should be added to 1.4.*

# Baseline Text Proposal (variables - 2)

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## 33.2.4.4 Variables

### ***Insert new variables as follows: (cont'd)***

pd\_4pair\_candidate This variable is provided for Type 3 and Type 4 PSEs to determine whether a connection is a candidate to receive power on both pair-sets. This variable is used to do physical layer 4PID, and is a function of the results of detection and connection check.

Values:

FALSE: Do not proceed to 4-pair classification (see 33.2.5)

TRUE: Proceed to 4-pair classification\*

\*NOTE – power on all 4 pairs, if applied, is subsequent to successful classification, and subject to maximum operating values of pair current as defined by Table 33-11.

# Baseline Text Proposal (variables - 3)

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(continued from previous page)

**maintain\_4pair\_power** This variable is provided for Type 3 and Type 4 PSEs to determine whether to continue providing 4 pair power. It is initially set to the value of `pd_4pair_candidate`. It may be reset by LLDP message from the PD after initial startup, as a result of enforcement of class power draw, or at vendor discretion.

Values:

FALSE: Remove power from at least one pair-set.

TRUE: Power may maintained on both pair-sets

*Editor's Note (to be removed prior to publication): classification enforcement text and LLDP messaging text will need to be drafted with the condition of setting `maintain_4pair_power=FALSE`*

**deny\_dual\_sig\_4pair\_power** Boolean variable that controls the denial of 4 pair power when connection check returns a value of DUAL. It is true when denying power is necessary including when set from the MDIO.

# Baseline Text Proposal (functions - 1)

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## 33.2.4.6 Functions

***Change function do\_detection as follows:***

do\_detection

This function returns the following variables:

signature: This variable indicates the presence or absence of a PD.

Values:

open\_circuit: The PSE has detected an open circuit. This value is optionally returned by a PSE performing detection using Alternative B, or by Type 3 and 4 PSEs performing detection over each pair-set, if either pair-set yields an open circuit.

valid: The PSE has detected a PD requesting power.

both\_alts\_valid: A Type 3 or Type 4 PSE has detected a PD requesting power on both pair-sets.

invalid: Neither open\_circuit, nor valid PD detection signature has been found.

*(text continues unchanged, including mr\_valid\_signature variable, adding the additional function on the next page)*

# Baseline Text Proposal (functions - 2)

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## 33.2.4.6 Functions

**Add new function, do connection check as follows:**

do connection check

This function returns the following variables:

PD signature: This variable indicates the type of PD signature connected to the PI, with respect to 4 pair operation.

Values:

open\_circuit: The PSE has detected an open circuit.

SINGLE: The PSE has determined there is a single signature PD configuration connected to the PI.

DUAL: The PSE has determined there is a dual signature PD configuration connected to the PI.

invalid: Either the PSE has detected an open\_circuit on one of the pair-sets, or is otherwise unable to determine whether the PD is a single-signature or dual-signature configuration.

**Editor's Note: Consider incorporating connection check variable and function within the do\_detection function.**

# Baseline Text proposal (state diagram -1)

## **Modify Figure 33-9: State Diagram to include:**

Process to include something to do connection check, (not in this presentation) following DETECT\_EVAL and prior to any classification

After connection check, set variable pd\_4pair\_candidate as follows:

$(\text{both\_alts\_valid}) * [ \text{PD\_signature} = \text{SINGLE} +$   
 $(\text{PD\_signature} = \text{DUAL}) * (!\text{deny\_dual\_sig\_4p\_power}) ]$

do\_detection function

**Now detects on both pair-sets  
Now Provides  
“both\_alts\_valid” (TRUE,  
FALSE) as output**

**do\_connection\_check function  
(new in state diagram)  
Provides “SINGLE, DUAL, or  
INVALID” as outputs**

**pd\_4pair\_candidate =  
both\_alts\_valid AND  
(PD\_signature =  
SINGLE OR DUAL)**

**Classification  
steps...**

Note: This is not meant to imply whether connection check and detection are asynchronous, serial, or part of the same process, but both do influence 4PID.

# Baseline Text proposal (state diagram – 2)

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## **Modify Figure 33-9: State Diagram to include:**

- (1) Set maintain\_4pair\_power to initial value of pd\_4pair\_candidate at POWER\_UP state.
- (2) Add an additional exit condition !maintain\_4pair\_power from the POWER\_ON state to the POWER\_DENIED state as follows:

Change Exit D from POWER\_ON state from:

power\_not\_available\*!short\_detected\*!ovld\_detected\*tmpdo\_timer\_not\_done\*!option\_vport\_lim

To:

power\_not\_available\*!short\_detected\*!ovld\_detected\*tmpdo\_timer\_not\_done\*!option\_vport\_lim +  
!maintain\_4pair\_power

## **Insert the following notes following Figure 33-9 State Diagram:**

NOTE: if maintain\_4pair\_power is false, then power must be removed from at least one pair set.



# Baseline text proposal (PD)

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***Insert the following to clause (PD clause) as follows:***

On type 1 and type 2 PDs wishing to avoid 4 pair power for longer than a minimal amount of time, the PD may signal this by a message via LLDP to the PSE setting the 'maintain\_4pair\_power' variable to FALSE.

# Baseline Text Proposal (4PID)

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***Add new subclause 3.2.5.6 as follows:***

## 33.2.5.6 4PID requirements

Type 3 and Type 4 PSEs shall determine whether an attached Type 1 or Type 2 PD or a Type 3 and 4 PD with classes 0 to 4 is a candidate to receive power on both pair sets prior to applying 4 pair power. This determination is referred to as a 4PID.

4PID shall be initially determined as a logical function of the detection state of both Alternative A & Alternative B pair sets, the result of the connection check and the results of other system information, as described in clause 33.2.5.0a. It shall be stored in the variable `pd_4pair_candidate`, defined in clause 33.2.4.4.

# Baseline Text Proposal (PSE Control register)

***Change row of Table 33-21, PSE Control Register, and insert new row below it, and above row for bit 11.5, as shown:***

Bit(s)	Name(s)	Description	R/W <sup>1</sup>
11.15:6 <del>7</del>	Reserved	Ignore when read	RO
11:6	<u>Deny Dual Signature PD 4 Pair Power</u>	<u>1 = Deny 4 pair power when connection check returns DUAL</u> <u>0 = Do not deny 4 pair power when connection check returns DUAL</u>	<u>R/W</u>

***Change 33.5.1.1.1 as shown:***

## **33.5.1.1.1 Reserved bits (11.15:6~~7~~)**

Bits 11.15:6~~7~~ are reserved for future standardization. ....

***Insert 33.5.1.1.1a :***

## **33.5.1.1.1a Deny Dual Signature PD 4 Pair Power (11.6)**

The provision of 4 pair power to dual signature PDs by physical layer 4 pair ID shall be inhibited by setting bit 11.6 to one. Writing a one to this register bit shall set deny\_dual\_sig\_4pair\_power to TRUE, and writing a zero to this register bit shall set deny\_dual\_sig\_4pair\_power to FALSE.

# Still to do (outside 4PID)

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- Draft class enforcement text for 4 pair PSEs
- Add LLDP TLVs for resetting maintain\_4pair\_power variable