Cl **00** *SC* **0** *P* *L* # i-287

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **G** *Comment Status* **D** *Editorial*

It will be a good standard, but at the moment there are missing so many instances, even if they can be considert editorial, that the commenter this time has to cast a negative vote .

SuggestedRemedy

The proposed changes or additions are seen at each comment.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

There is no specific issue identified and no suggested remedy to implement.

Cl **00** *SC* **0** *P* *L* # i-290

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **G** *Comment Status* **D** *Multidrop*

in clause 147.1 to 147.1.2 the new multidrop usage is described but the System interrelation and possible limitations description are missing. Questions are: 1- can multidrop segments be cascaded to form a tree and if yes how many. 2- How long can be a new link attached to a drop (after the phy not the stub). 3-How many electronics(e.g. switches) can be attached to each drop? 4- is energy efficiency an option? There may be additional questions!

SuggestedRemedy

Add a clause here or at an other place explaining the new multidrop advantages and limitations. The simplest example would be an automotive door.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Comment is unclear as to whether it requests tutorial applications information or if specifications are missing. The specification provides the maximum insertion loss and delay associated with a mixing segment which defines the configuraions. Termination requirements are given. Which specifications may be missing is unclear.

If the commenter means for tutorial applications information, then the standard is not a tutorial.

Cl **00** *SC* **0** *P* *L* # i-26

Berger, Catherine

Comment Type **G** *Comment Status* **D** *Editorial*

This draft meets all editorial requirements.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.2.2.2.1** *P* **0** *L* **0** # i-205

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA*

As I think I understand PLCA the occurance of collision at any point during reception is an error. If that is the case, then collision (in the presence of PLCA operation) should be added to the list of error statistics in this clause.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Collisions on the media in the presence of PLCA operation are already counted by the bits in register 3.2294.15:0 (see 45.2.3.68f.1). No change is required.

Cl **00** *SC* **0** *P* **1** *L* *#* i-27

Robinson, Gary RETIRED/unemployed

Comment Type **TR** *Comment Status* **D** *PLCA*

This standard is well written for its intended purpose but I do not believe it belongs as an amendment to 802.3 series.

This standard does not conform to the layer 1, 2, or 3 rules as the rest of 802.3.

Physical Layer Collision Avoidance (PLCA) when combined with CSMA/CD (which remains as an error handling function) constitutes a new Media Access Control (MAC) function and as such belongs in the MAC sublayer, not in the Physical Sublayer. Where such a function is appropriately placed is a matter of architecture, not implementation per clause 1.1.3 of the standard.

I would be satisfied if it was moved out of 802.3 and into 802.n or another series all together.

As the original contributor of CSMA/CD, 802.3 I have argued this issue before and I am sure it is not the last time.

SuggestedRemedy

I would be satisfied if it was moved out of 802.3 and into 802.n or another series all together.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The specification of PLCA is appropriately placed in the physical layer and carries out the operations delegated to the physical layer in the 802.3 architecture, providing mapping of PLS primitives to signalling for the PHY, and aligning the MAC data with the needs of the PHY. Nodes implementing the PLCA RS are interoperable on the same mixing segment with nodes without the PLCA RS implemented or enabled. The functions are located in the physical layer according to the definitions in ISO 7894-1:1994, which states that the physical layer provides "functional and procedural means to activate, maintain, and de-activate physical-connections for bit transmission between data-link-entities." (7.7.2), and that "functions may be provided by the (N)-layer to enhance the facilities offered to, and the quality of service seen by the (N+1)-entities over those which are offered to the (N)-layer by the (N-1)-layer" (5.3.3.1.2). The PLCA RS conforms to the Pysical layer service specifications in IEEE 802.3 by interfacing with the MAC at the existing PLS_CARRIER, PLS_DATA_VALID, and PLS_SIGNAL primitives and providing the information necessary for the local MAC sublayer entity to perform media access functions. (IEEE Std 802.3-2018 6.2.3). The augmentation of the physical layer is consistent with prior augmentation of these primitives in IEEE Std 802.3 over its lifetime, but particularly the last 20 years. For further information, please see
http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf

Cl **00** *SC* **0** *P* **2** *L* **3** *#* i-206

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *PLCA*

There is no mention of the addition of a new half duplex shared media access method (PLCA) in the abstract.

SuggestedRemedy

If PLCA is to remain in the draft (no matter what layer) then it should be mentioned in the abstract. It is a major addition to 802.3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert,
"These include two new 10 Mb/s PHY types and a new Reconciliation Sublayer for enhanced performance of half-duplex 802.3 networks on shared-media."

after the sentence ending on page 1, line 3.

Cl **00** *SC* **0** *P* **11** *L* **15** # i-207

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *Editorial*

The following statement in the introductory material is not true: "Ethernet at 10 Mb/s was approved as an IEEE standard by the IEEE Standards Board in 1983 and subsequently published in 1985 as IEEE Std 802.3-1985." What was initially approved and published by the IEEE was not identified as Ethernet. The only mention of the word "Ethernet" in the first 802.3 standard is in an acknowledgement on page 7 of the front matter between the Working Group member listing and the Standards Board membership roster. "The IEEE 802.3 Working Group acknowledges and appreciates that many concepts embodied in this standard are based largely upon the CSMA/CD access method earlier described in The Ethernet specification as written jointly by individuals from Xerox Corporation, Digital Equipment Corporation, and Intel Corporation. Appreciation is also expressed to Robert M. Metcalfe and David R. Boggs for their pioneering work in establishing the original concepts." IEEE Std 802.3-1985

SuggestedRemedy

Change the sentence to read: The derivative at 10 Mb/s was approved as an IEEE standard by the IEEE Standards Board in 1983 and subsequently published in 1985 as IEEE Std 802.3-1985 titled Information technology-- Telecommunications and information exchange between systems-- Local and metropolitan area networks-- Specific requirements-- Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment is against text that is not changed by this amendment. Further, the text in the introductory material is exactly as provided in draft 3.8 of the Framemaker amendment template and in the introduction to IEEE Std 802.3-2018. The commenter is encouraged to submit a Maintenance request.

Cl **00** *SC* **0** *P* **11** *L* **20** # i-208

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Editorial*

This material does not address the radical change in the title done in the 2012 revision.

SuggestedRemedy

Insert the following text in front of the current text: "The title of the standard was changed to the more concise 'Standard for Ethernet' with the 2012 revision."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment is against text that is not changed by this amendment. Further, the text in the introductory material is exactly as provided in draft 3.8 of the Framemaker amendment template and in the introduction to IEEE Std 802.3-2018. The commenter is encouraged to submit a Maintenance request.

Cl **00** *SC* **FM** *P* **12** *L* **28** # i-9

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *Editorial*

The Editor's note: "New front matter text needs review." should be removed.

SuggestedRemedy

Review the text and delete the note.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Delete Editor's note on lines 28-31

Cl **00** *SC* **FM** *P* **13** *L* **5** # i-323

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Suggest that '... on a single balanced pair copper cable.' should be changed to read '... on a single balanced pair of conductors.'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "on a single balanced pair copper cable."

with, "on a single balanced pair of conductors."

Cl **01** *SC* **1.3** *P* **26** *L* **38** # i-288

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *Editorial*

On link coupling attenuation limit it was decided to do the same as other limits but as being the first measurement standard specifying .1 MHz to add it in the list of references.

SuggestedRemedy

Add "IEC 62153-4-9 Ed2 Amd1: Coupling attenuation
of screened balanced cables, triaxial method" in the list if Normative references

Proposed Response *Response Status* **W**

PROPOSED REJECT.

IEC 62153-4-9 does not appear in the draft as a reference and there is no comment to add it.

Cl **00** *SC* **FM** *P* **26** *L* **52** # i-10

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *Editorial*

"IEEE P802.3bj and IEEE P802.3bk" are not projects "running in parallel". They were completed some time ago and the amendments have been incorporated into the base standard.

SuggestedRemedy

Change "IEEE P802.3bj and IEEE P802.3bk" to: "IEEE P802.3ca and IEEE P802.3cm" (or some other current projects).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "IEEE P802.3bj and IEEE P802.3bk"

with, "IEEE P802.3ca and IEEE P802.3cm"

Cl **01** *SC* **1.1.3** *P* **27** *L* **8** # i-11

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *EZ*

In the editing instruction, "Figure 1--1" should be "Figure 1-1" (en dash rather than em dash)

SuggestedRemedy

In the editing instruction, change "Figure 1--1" to "Figure 1-1" (en dash rather than em dash)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.4** *P* **27** *L* **16** # i-210

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PCS*

Modify the current 802.3 definition of 1.4.131 that is now incomplete.

SuggestedRemedy

Change text to read: "1.4.131 8B/10B transmission code: A DC-balanced octet-oriented data encoding specified in IEEE Std 802.3, Table 36-1a-e, Table 36-2 and Table 147-1."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

8B/10B transmission codes are not used in Table 147-1 or elsewhere in the amendment.

Cl **01** *SC* **1.4** *P* **27** *L* **16** # i-209

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Cabling*

Modify the current 802.3 definition of 1.4.298 that is restricted by the current text.

SuggestedRemedy

Change text to read: 1.4.298 jumper cable assembly: An portable electrical or optical assembly, used for the bidirectional transmission and reception of information, consisting of a pair of
MDI connectors and their interconnecting media. This assembly may or may not contain additional components, located between the plug connectors, to perform equalization.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The comment is unclear about how this definition, which does not used in the draft, is related to the amendment.

Cl **01** *SC* **1.1.3** *P* **27** *L* **30** # i-316

Kabra, Lokesh Synopsys, Inc.

Comment Type **G** *Comment Status* **D** *MII*

Figure 90-1 (Note 1) of 802.3-2018 indicates that MII is used only for 100 Mb/s and above. If clause 90 is applicable on MII of 10BASE-T1S/L, then this note needs to be updated to avoid confusion

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Note 1 of Figure 90-1 states "NOTE 1-In this figure, the xMII is used as a generic term for the Media Independent Interfaces for implementations of 100 Mb/s and above. For example: for 100 Mb/s implementations, this interface is called MII; for 1 Gb/s implementations, it is called GMII; for 10 Gb/s implementations, it is called XGMII; etc."

The statement is relative to the content of Figure 90-1, and does not say "only for 100 Mb/s and above" as the Commenter states. The statement remains correct with the addition of 10BASE-T1S and 10BASE-T1L using the MII.

Cl **01** *SC* **1.1.3** *P* **27** *L* **31** # i-211

Thompson, Geoffrey Independent Consultant

Comment Type **T** *Comment Status* **D** *MII*

The note text in Fig. 1-1 says: "for 100 Mb/s implementations this interface is called MII" but this is a 10 Mb/s implementation and 10 Mb/s implementations including this one (Ref: cl. 148.3 and 148.4.1)

SuggestedRemedy

Change the quoted text to read: "for 10 and 100 Mb/s implementations this interface is called MII"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The note text does not say what the comment says - it says "For example: for 100 Mb/s implementations this interface is called MII". Text is correct. No change necessary.

Cl **01** *SC* **1.3** *P* **28** *L* **18** # i-25

Fritsche, Matthias HARTING Technologie Gruppe

Comment Type **E** *Comment Status* **X** *MDI*

The IEC 61076-3-125 is now renumbered from IEC SC48B secretary to IEC 63171-6 during the publishing process of the document 48B_2720e_CDV at the 2019-03-01.

SuggestedRemedy

Change in the complete document the references from "IEC 61076-3-125" to "IEC 63171-6"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Defer.

Resolve comments i-196 and i-197 first.

Change the reference to a document that will be published by the expected date of RevCom submittal or remove this reference.

Copy resolution to this comment into comment i-4.

Copy resolution of this comment when resolving i-12.

Cl **01** *SC* **1.3** *P* **28** *L* **22** # i-4

Hajduczenia, Marek Charter Communications

Comment Type **ER** *Comment Status* **D** *MDI*

So what happens when IEC 61076-3-125 is not published by the time this draft is done? Do you wait for its completion?

SuggestedRemedy

I am not sure what the strategy is in case of IEC specifications in flight, but we cannot (I believe) have a reference to an unpublished IEC draft. It seems that the spec would have to wait for iEC publication to become available?
The same comment / question about IEC 63171-1 under development

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Defer.

Resolve comment i-25 first.

Copy resolution to i-25 into this comment.

Cl **01** *SC* **1.3** *P* **28** *L* **24** # i-12

Anslow, Peter Ciena

Comment Type **TR** *Comment Status* **D** *MDI*

The editor's note says "IEC 61076-3-125 is still in development. The publication date will need to be inserted and the document title and number confirmed."
However, the IEC web site does not contain any status information on IEC 61076-3-125. This suggests that the document number is incorrect or it will not be published by the expected approval date for the P802.3cg amendment of September 2019.
Since any normative reference has to be available at the time of approval of the draft, this issue has to be corrected prior to the draft being suitable for RevCom submittal.

SuggestedRemedy

Either:
Change the reference to a document that will be published by the expected date of RevCom submittal or remove this reference.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Defer.

Resolve comment i-25 first.

Copy resolution to i-25 into this comment.

Cl **01** *SC* **1.3** *P* **28** *L* **39** # i-13

Anslow, Peter Ciena

Comment Type **TR** *Comment Status* **X** *MDI*

The editor's note says "IEC 63171-1 is still in development. The publication date will need to be inserted."
However, the IEC web site shows an expected publication date for IEC 63171-1 of May 2020.
Also, the title shown on the IEC web site is "IEC 63171-1, Connectors for Electrical and Electronic Components--Product Requirements--Part 1: Detail specification for 2-way, shielded or unshielded, free and fixed connectors: mechanical mating information, pin assignment and additional requirements for TYPE 1 / Copper LC Style"
Since any normative reference has to be available at the time of approval of the draft, this issue has to be corrected prior to the draft being suitable for RevCom submittal.

SuggestedRemedy

Either:
Change the reference to a document that will be published by the expected date of RevCom submittal or remove this reference.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Defer.

Resolve comments i-196 and i-197 first.

Cl **01** *SC* **1.4** *P* **28** *L* **48** # i-324

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Subclause 1.4.151 of IEEE Std 802.3-2018 reads 'BASE-T1: PHYs that belong to the set of specific Ethernet PCS/PMA/PMDs that operate on a single twisted-pair copper cable, including 100BASE-T1 and 1000BASE-T1. (See IEEE Std 802.3, Clause 96 and Clause 97.)'. This definition needs to be updated to add 10BASE-TS1 and 10BASE-TL1.

SuggestedRemedy

Suggest that the following change be added to subclause 1.4 of IEEE P802.3cg:

In subclause 1.4.151 of IEEE Std 802.3-2018, the text '... that operate on a single twisted-pair copper cable, including 100BASE-T1 and 1000BASE-T1. (See IEEE Std 802.3, Clause 96 and Clause 97.)' be changed to read "... that operate on a single twisted-pair copper cable, including 10BASE-T1S, 10BASE-T1L, 100BASE-T1 and 1000BASE-T1. (See IEEE Std 802.3, Clause 96, 97, 146 and 147).'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert editor's instruction, "Change the Definition for 1.4.151 BASE-T1 as follows:" on page 29, line 4.

Insert the definition for clause 1.4.151 BASE-T1 from IEEE Std 802.3-2018 after the editor's instruction.

Grant editorial license to show the change of

replace, "that operate on a single twisted-pair copper cable, including 100BASE-T1 and 1000BASE-T1. (See IEEE Std 802.3, Clause 96 and Clause 97.)"

with, "that operate on a single twisted-pair copper cable, including 10BASE-T1S, 10BASE-T1L, 100BASE-T1 and 1000BASE-T1. (See IEEE Std 802.3, Clause 96, Clause 97, Clause 146, and Clause 147)."

with appropriate strikeouts and underlines.

Cl **01** *SC* **1.5** *P* **29** *L* **22** # i-14

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *EZ*

The expansion for the abbreviation "DCR" should not be capitalised as this is not a proper noun.

SuggestedRemedy

Change "Direct Current Resistance" to "direct current resistance"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.5** *P* **29** *L* **23** # i-5

Hajduczenia, Marek Charter Communications

Comment Type **E** *Comment Status* **D** *Editorial*

I do not believe we need abbreviation added for a term that is already defined and abbreviated in definition (1.4.389a)

SuggestedRemedy

Remove abbreviation for PLCA

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The remedy is not aligned with similar examples in 802.3-2018. See Definition and Abbreviation entries for bit error ratio and BER and bit rate and BR as two examples.

Cl **01** *SC* **1.4** *P* **29** *L* **51** # i-289

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *Editorial*

The definition of T1S shows the same wording as T1L. Only the reach is different. But this is not the only difference. It may be additionally a point to multipoint System and only half duplex. No optional PoDL is described. It may be also 25m long.

SuggestedRemedy

This needs some editing by a native speaker. As the commenter is not able to do this in good english he would grant editor liscence to do so

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.

CRG disagrees with the commenter - comment appears to desire some tutorial text on some certain aspects of Clause 147 and, possibly, Clause 104. The referenced clause provides that information and further exposition is not appropriate for the definition.

Cl **9** *SC* **9.1** *P* **30** *L* **4** # i-291

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **T** *Comment Status* **D** *Multidrop*

The sentence about a repeater is misleading. Repeaters are mentioned in clause 30 but not in clause 146 or 147 or what is meant with exception?

SuggestedRemedy

not understood, no proposal can be made.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Comment is unclear as to whether it requests tutorial applications information or if specifications are missing. Clause 9 specifies repeaters for 10 Mbps networks. This clause clarifies that Clause 9 repeaters are not specified for 10BASE-T1L and 10BASE-T1S.

Cl **9** *SC* **9.1** *P* **30** *L* **8** # i-212

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Multidrop*

Correction text is incorrect and baseline text is (now) incomplete.

SuggestedRemedy

Change text to read: "This clause specifies a repeater for use with half duplex IEEE 802.3 10 Mb/s baseband networks, with the exceptions of 10BASE-T1S (Clause 147). A repeater for any other IEEE 802.3 network type is beyond the scope of this clause."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The correction text is not incorrect, as proposed text covers the same two exceptions in a different way. The ommenter's suggested remedy goes beyond this amendment and potentially excludes legacy full-duplex 802.3 PHYs (e.g., 10BASE-T full duplex), which were previously included. No change is needed.

Cl **22** *SC* **22.1** *P* **31** *L* **2** # i-305

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *MII*

Figure 22-1 requires similar update as done for Figure 1-1 in 802.3cg

SuggestedRemedy

Change "100 Mb/s, 1 Gb/s" to "10BASE-T1L, 10BASE-T1S, 100 Mb/s, 1 Gb/s"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Copy and insert the clause 22.1 header and figure Figure 22-1 from 802.3-2018 into page 31, line 3.

Insert editor's instruction, "Change the text at the bottom of the right column in Figure 22-1 as follows:" after the inserted clause 22.1 header.

3) Insert "10BASE-T1L, 10BASE-T1S, " in underline before "100 Mb/s, 1 Gb/s" at the bottom on the right column in Figure 22-1.

Cl **22** *SC* **22** *P* **31** *L* **13** # i-394

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *MII*

[CSD] CSD/Compatibility states "As a PHY amendment to IEEE Std802.3, the proposed project will use MII, and follow the existing format and structure of IEEE 802.3 protocol-independent specification of managed objects." It does NOT state that it will change MII and then use the modified version of MII. It states that this project will use MII. This project violates the stated compatibility statement. In addition, MII is widely used and deployed exposed interoperability interface, still with large installed based that is difficult to determine (installation spread over 10~15 years, starting 20+ years ago). One of the test whether an interface has been materially changed is by looking at the PICS in CL22.8.3 and there are 5 enteries that changes the requirments to the installed base of MII.

SuggestedRemedy

Reverse all material changes to CL22 and make appropriate changes in other clauses of this project to make it work with CL22. If this cannot be done, then appropriate changes to the CSD/Compatibility with regard to CL22 be made and to be approved.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Comment is out of scope in that CSD/Compatibilty is an internal 802 document, not in scope of standards association ballot.

Additionally, the Comment Resolution Group (CRG) disagrees with the commenter. Functionality is specified using reserved codes at the MII to prevent any compatibility issue with compliant PHYs.

Cl **22** *SC* **22.2.2.4** *P* **31** *L* **17** # i-213

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA*

BIG TICKET ITEM: Remove the changes you have here for PLCA. IFF you are going to insist that the PLCA lives in the Physical Layer then you don't get to change the layer interface to the MAC to accommodate a PLCA.

SuggestedRemedy

Remove the changes here and document them in clause 148. This is apprpriate for a) keeping PLCA identified as being in the Physical Layer, b) Placing PLCA as a new supplementary MAC sublayer below the CSMA/CD sublayer or c) moving PLCA to a new standard for a MAC sublayer shim to Ethernet to convert CSMA/CD to CSMA/CA. This is my preferred solution which I would label "Standard for DetermiNet".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The commenter is incorrect. The layer interface to the MAC is not modified. The interface to the MAC, according to Clause 6 are the Physical Layer service specifications. These primitives are unmodified. Only the interface within the physical layer, the MII, which is between the RS and the PHY is modified.

Cl **22** *SC* **22.2.2.5** *P* **31** *L* **49** # i-395

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *MII*

In "..with the exception of 10BASE-T1L (see 146.3.3.1) and 10BASET1S(see 147.3.2.1, Figure 147-4).", 10BASE-T1L is unnecesarily included as if 10BASE-T1L requires this change. It doesn't. TXER was added during 100 Mbps Ethernet projects, and some 10 Mbps system implementations being upgraded to 100 Mbps would experience buffer underruns, and wanted to have an option to signal to the PHY to corrupt the FCS. 10 Mb/s system never had such considerations nor signal that corresponds to TXER. If TXER is asserted, then 10BASE-T1L merely maps to an error symbol.

There is no need to change CL22 from 10BASE-T1L, and having it included in this proposed revision to CL22 distracts from the fact that CL22 modification is entirely caused by CL148 PLCA RS.

SuggestedRemedy

Remove the text "10BASE-T1L (see 146.3.3.1) and ", and make appropriate changes to the 10BASE-T1L (CL146) to remove superfluous support of TXER.

(Note: the subjective "superflueous" is used becase in modern (higher performance) systems as well as back in 10 Mbps systems, the need for FIFO underrun implementational error handling are not needed).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The Comment Resolution Group (CRG) disagrees with the commenter. The idea is not to preclude using TX_ER with new 10BASE-T PHYs, so an exception has been added.

Cl **22** *SC* **22.2.1.3.3** *P* **32** *L* **3** # i-306

Kabra, Lokesh Synopsys, Inc.

Comment Type **G** *Comment Status* **D** *PLCA*

Second paragraph in 22.2.1.3.3 states that ".. any transition of the CRS signal from asserted to deasserted must cause a transition of CARRIER_STATUS from the CARRIER_ON to the CARRIER_OFF value". This is not adhered to when PLCA is activated or enabled. Hence suggest to add aparagraph (similar to the paragragph added for EEE exception)

SuggestedRemedy

Add new paragraph at end of 22.2.1.3.3.
When PLCA functions is enabled, CARRIER_STATUS is overridden according to the behavior of the PLCA DATA state diagram (see 148.4.6)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The PLCA Reconciliation Sublayer is an extension of the RS defined in Clause 22, as specified in 148.4.1. The mapping between the MII and the PLCA RS is defined in Clause 148.4.3, which includes the CARRIER_STATUS parameter (which is set according to the PLCA data state diagram in 148.4.6, as the commenter indicated correctly). See also 148.4.3.3.

Additionally, 148.4.2 reads "When PLCA functions are not supported or are disabled by the management interface (plca_en = FALSE), RS operation shall conform to the MII RS definition in Clause 22.". Therefore modifying the text in Clause 22 as the commenter suggests would create a recursive reference.

Cl **30** *SC* **30.2.2.1** *P* **34** *L* **8** # i-214

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *PLCA*

There is no addition to the text of the last sentence for oPHYEntity to note its containment of your new oPLCA (Needed to be consistent with your view of the world. Not needed here for my view of the world.)

SuggestedRemedy

Add appropriate text to the last sentence of oPLCA.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

At page 34, line 14-16, replace the text for oPHYEntity in 30.2.2.1 (as amended by IEEE Std 802.3bt-2018) with,

"If oOMPEmulation is implemented, oPHYEntity is contained within oOMPEmulation. If oMACMergeEntity is implemented, oPHYEntity is contained within oMACMergeEntity. Otherwise oPHYEntity is contained within oMACEntity. Many instances of oPHYEntity may coexist within one instance of oMACEntity or oMACMergeEntity; however, only one PHY may be active for data transfer to and from the MAC at any one time. oPHYEntity is the managed object that contains the MAU, PAF, PLCA, PSE, and PoDLPSE managed objects in a DTE."

Grant editorial license to insert strikeout and underlines to show insertions and deletions from amended IEEE Std 802.3bt-2018 text.

Cl **30** *SC* **30.2.3** *P* **35** *L* **1** # i-307

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *Editorial*

Object oOAM shown in Figure 30-3 of 802.3-2018 is missing in new Figure 30-3 of 802.3cg

SuggestedRemedy

Correct Figure 30-3 for missing oOAM object and its input/output connection arrows

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.2.5** *P* **36** *L* **34** # i-312

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *Editorial*

Mixing of rows in table for ACTION and ATTRIBUTES for this oPLCA object class

SuggestedRemedy

Alphabhetically Sort and place rows for ACTION below the ATTRIBUTE for oPLCA object

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment is against text that is not changed by this amendment. The commenter is encouraged to submit a Maintenance request.

Cl **30** *SC* **30.2.5** *P* **36** *L* **34** # i-311

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *PLCA*

Attribute aPLCAStatus not listed for oPLCA managed object class in Table 30-1c

SuggestedRemedy

Add row for "aPLCAStatus" after the "aPLCAAdminState" attribute row

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert row for "aPLCAStatus" after the "aPLCAAdminState" attribute row as follows:

aPLCAStatus | ATTRIBUTE | GET | | | | | | | | X |

Cl **30** *SC* **30.2.5** *P* **36** *L* **52** # i-15

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *EZ*

When a table splits across two pages, the bottom ruling on the first page should be "very thin"

SuggestedRemedy

In Table 30-1c, uncheck "Draw Bottom Ruling on Last Sheet Only"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.3** *P* **37** *L* **31** # i-215

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA*

I believe that the BEHAVIOUR of each of the following MAC attributes may need additional text to describe how it behaves (differently) when used in a PLCA network: 30.3.1.1.3 aSingleCollisionFrames; 30.3.1.1.4 aMultipleCollisionFrames; 30.3.1.1.9 aFramesWithDeferredXmissions; 30.3.1.1.10 aLateCollisions; 30.3.1.1.20 aFramesWithExcessiveDeferral; 30.3.1.1.30 aCollisionFrames; 30.3.1.1.31 aMACCapabilities; 30.3.1.1.32 aDuplexStatus

SuggestedRemedy

Examine each BEHAVIOUR for each of the listed attributes in the context of PLCA operation and augment the text definition of each BEHAVIOUR to cover operation in PLCA mode. This should explicitly cover whether an occurrence is an error in PLCA operation when such is not the case in CSMA/CD.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

PLCA does not to change the behavior of these attributes.

Cl **30** *SC* **30.3.9** *P* **38** *L* **3** # i-398

Kim, Yongbum NIO

Comment Type **ER** *Comment Status* **D** *Management*

PLCA managed object class is put in the wrong part of the CL30. 30.3 is Layer mgmt for DTEs. This project claims to be a Physical Layer project. 30.8 is WIS. 30.14 is MAC Merge. Logically and structurally, PLCA does not belong under 30.3, where it is also more difficult to find. It should follow other sublayer additions in CL30 and go after 30.15. If this project insists that this content belongs in DTE (where MAC resides and Physical Layer doesn't) clause, then own up to what PLCA really is -- a MAC, or signifcant portion therer of.

SuggestedRemedy

Renumber and change the instructions to add this proposed 30.3.9 to be inserted after current 30.15

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Commenter is incorrect in that PHY entities are part of 30.3 (see 30.3.2 PHY device managed object class).

Implement the following changes:

P36 L1 - P37 L28: remove edits to Table 30-1c

P36 L1 Add new editing instruction and table 30-11:
"Insert new Table 30-11 PLCA capabilities after Table 30-10 as follows:"

add new table 30-10 - PLCA capabilities
With 4 columns
(last column, with "X"'s is labeled: "PLCA Capability (optional)")
Rows are from P36 L32 - P36 L42:

oPLCA managed object class (30.3.9)
aPLCAAdminState ATTRIBUTE GET X
acPLCAAdminControl ACTION X
acPLCAReset ACTION X
aPLCANodeCount ATTRIBUTE GET-SET X
aPLCALocalNodeID ATTRIBUTE GET-SET X
aPLCATransmitOpportunityTimer ATTRIBUTE GET-SET X
aPLCAMaxBurstCount ATTRIBUTE GET-SET X
aPLCABurstTimer ATTRIBUTE GET-SET X

P38 L1: Change editing instruction to read: "Insert new clause 30.16 after 30.15 (and its subclauses) as follows:"

Change numbering of 30.3.9 oPLCA managed object class to 30.16 (and promote subclauses 1 level)

Cl **30** *SC* **30.3.9.1.1** *P* **38** *L* **13** # i-308

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *EZ*

As per format of previous, similar sub-sections in 802.3-2018, the enumerated values for a attribute are listed in new lines

SuggestedRemedy

Move "disabled enabled" in to new lines for each value;
Make similar formattinng for other attributes in below sub-sections (line 24, line 37, line 50)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

On page, 38:

Replace,
"An ENUMERATED VALUE that has the following entries: disabled enabled"

with,
An ENUMERATED VALUE that has the following entries:
disabled
enabled"

in two locations (line 13 and line 37)

Replace,
"An ENUMERATED VALUE that has the following entries: TRUE FALSE"

with,
An ENUMERATED VALUE that has the following entries:
TRUE
FALSE"

on line 24

Replace,
"An ENUMERATED VALUE that has the following entries: reset normal"

with,
An ENUMERATED VALUE that has the following entries:
reset
normal"

on line 50

Cl **30** *SC* **30.3.9** *P* **38** *L* **15** # i-24

Thompson, Michael nVent

Comment Type **E** *Comment Status* **D** *Editorial*

In 12 places "behaviour" should be "behavior".

SuggestedRemedy

Change "behaviour" to "behavior" in all occurrences.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

BEHAVIOUR in clause 30 is a "reserved" word and its use in this amendment is consistent with 802.3-2018.

Cl **30** *SC* **30.3.9.1.1** *P* **38** *L* **15** # i-216

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *PLCA*

I feel that the "Behaviour" descrption could be improved.

SuggestedRemedy

Replace text with: A read-only value that indicates the mode of operation of the Reconciliation Sublayer for PLCA operation. When PLCA is enabled, the reconciliation sublayer functions in PLCA mode whose operation is defined by Clause 148. When PLCA functions are not supported or are disabled by the management interface (plca_en = FALSE), RS operation shall conform to the MII RS definition in Clause 22. By default, PLCA is disabled.;

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.3.9.1.2** *P* **38** *L* **29** # i-309

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *Editorial*

The last sentence is redundant as the mapping of aPLCAStatus to plca_status variable is already specified in previous sentence

SuggestedRemedy

Remove last sentence " aPLCAStatus maps to the variable plca_status iin the PLCA Status state diagram specified in 148.4.7.1"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.3.9.2.2** *P* **39** *L* **1** # i-310

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *EZ*

Typo error " Clause 147 PLCA"

SuggestedRemedy

Correct "Clause 147 PLCA" to "Clause 148 PLCA"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.3.9.2.2** *P* **39** *L* **1** # i-217

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA*

The text: "After reset is complete, acPLCAReset returns 1 to normal" implies that this management entity is READ-WRITE. To my knowledge, an ACTION is a write only operation.

SuggestedRemedy

Confirm whether an ACTION of this sort requires a single operation (i.e. sends a pulse) or two operations (i.e. actuate, then deactuate) then modify the behavior text to make clear the nature of the operation and what it takes to exert it properly.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Delete " After reset is complete, acPLCAReset returns to normal. The default state of acPLCAReset is normal." on page 39, line 1.

Cl **30** *SC* **30.3.9.2.3** *P* **39** *L* **4** # i-313

Kabra, Lokesh Synopsys, Inc.

Comment Type **E** *Comment Status* **D** *Editorial*

Attributes aPLCANodeCount to aPLCABurstTimer are placed under PLCA device actions sub-section

SuggestedRemedy

Change 30.3.9.2.3 to 30.3.9.2.7 to 30.3.9.1.3 to 30.3.9.1.7 and move accordingly

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Re-number clauses 30.3.9.2.3 to 30.3.9.2.7 to 30.3.9.1.3 to 30.3.9.1.7 and move to appear after 30.3.9.1.2.

Cl **30** *SC* **30.3.9.2.3** *P* **39** *L* **4** # i-266

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA*

As far as I know, the actual viability of a 255 node network has not been established. It is certainly true that a 255 node PLCA network is not within our goal set (Ref: Obj. 11b) and it has been asserted in an ad hoc that such a high node count would interfere with long established 802.3 error detection mechanisms. Therefore, even though a generous address space (255) is appropriate so that it will not have to be revisited, 255 is not an appropriate default value.

SuggestedRemedy

In accordance with our objectives, change the default value to 8.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment i-189.

Response to Comment i-189 is:

At page 39, line 12 insert " The default value is 255.;" to " The default value is 0.;"

At page 39, line 22 insert " The default value is 255." after "This value is assigned to define the ID of the local node on the PLCA network."

Cl **30** *SC* **30.3.9.2.3** *P* **39** *L* **4** # i-267

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA*

(Wrong page & section ref. Put here for sorting purposes) In the current configuration of the draft it appears that the BEHAVIOUR of the Late Collision Counter (30.3.1.1.10 aLateCollisions) is incomplete.

SuggestedRemedy

Augment the referenced BEHAVIOUR with a PLCA conditional statement that describes what causes a late collision in the PLCA case including whether it is a normal or error condition.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

A late collision at the MAC is a late collision. Its definition is unchanged and no additional text is needed.

Cl **30** *SC* **30.3.9.2.3** *P* **39** *L* **12** # i-189

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type **T** *Comment Status* **D** *PLCA*

aPLCANodeCount has a default value of 255. This makes no sense at all since this attribute is
used to set the maximum number of nodes that will get a transmit opportunity on the local collision domain, as specified in Clause 148.
This is one of the parameters that have to be set prior to enable PLCA operations, as stated in
148.4.5.1.

On the other hand, aPLCALocalNodeID has no default value, which also makes no sense as value 255 is used to prevent PLCA from starting a cycle of transmit opportunities as shown in figure 148-3 in the transition from DISABLE to RESYNC state.

SuggestedRemedy

At line 12 change " The default value is 255.;" to " The default value is 0.;"
At line 22 add " The default value is 255." after "This value is assigned to define the ID of the local node on the PLCA network."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.3.9.2.4** *P* **39** *L* **21** # i-6

Hajduczenia, Marek Charter Communications

Comment Type **E** *Comment Status* **D** *PLCA*

We typically avoid the use of "must" except for the use cases specidified in Style Manual - this is not the case.

SuggestedRemedy

Change "Value must be" to "Value is"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by i-190.

The resolution to i-190 is:

Replace,
"Value must be in the range of [0, aPLCANodeCount - 1] (inclusive).;"

with, "Valid range is 0 to 255, inclusive.;"

Cl **30** *SC* **30.3.9.2.4** *P* **39** *L* **21** # i-190

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type **T** *Comment Status* **D** *PLCA*

The description of aPLCALocalNodeID specifies that the number must be in the range of 0 to aPLCANodeCount-1.
However, in figure 148-3 the "local_nodeID" variable, which maps to aPLCANodeCount, is checked in the transition from "DISABLE to "RESYNC" against the value 255.
Additionally, a node with local_nodeID >= aPLCANodeCount would not be able to send a packet during a cycle of transmit opportunities but it could receive packets as normal.
Since this is the desired behavior, it should not be disallowed by the valid range of aPLCALocalNodeID.

SuggestedRemedy

Replace "Value must be in the range of [0, aPLCANodeCount - 1] (inclusive).;"
with "Valid range is 0 to 255, inclusive.;"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.3.9.2.4** *P* **39** *L* **22** # i-16

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *PLCA*

IEEE uses an en dash as a minus sign.

SuggestedRemedy

In "[0, aPLCANodeCount - 1]" change the hyphen to an en dash (Ctrl-q shift-p)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by i-190.

The resolution to i-190 is:

Replace,
"Value must be in the range of [0, aPLCANodeCount - 1] (inclusive).;"

with, "Valid range is 0 to 255, inclusive.;"

Cl **30** *SC* **30.3.9.2.5** *P* **39** *L* **24** # i-401

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA*

aPLCATransmitOpportunityTimer seem to be a tuning parameter that is related with both PHY delay and given propogation delay (network diagmeter). And the PHY delays of *all* the nodes in the system. The default value of 20 bit times does not match 8 node 15 meter network worst case pararmeter.

SuggestedRemedy

Provide the default value that represent the worst case delays and supported network diameter such that a network using all defaults (plug and play and no configuration) is assured to work. If

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment i-191.

Response to Comment i-191 is:

Replace, "The default value is 20."

with, "The default value is 24." on page 39, line 34.

Cl **30** *SC* **30.3.9.2.5** *P* **39** *L* **34** # i-191

Baggett, Tim Microchip Technology, Inc.

Comment Type **T** *Comment Status* **D** *PLCA*

The current PLCA Transmit Opportunity Timer is set to 20 bit times (BT). This needs to be changed to 24BT to insure proper operation over a mixing segment of 25m with worst case propagation delay.

Details or the derivation may be found in the presentation located at http://www.ieee802.org/3/cg/public/adhoc/802d3cg_beruto_plca_timings.pdf

SuggestedRemedy

Change:
"The default value is 20."
To:
"The default value is 24."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.3.9.2.6** *P* **39** *L* **36** # i-400

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA*

Capability for aPLCAMaxBurstCount set to 255 packet bursts would significantly impact fairness ("multiple-access") and would cause upper layer protocol time-outs.

SuggestedRemedy

Reduce the burst down to maximum size frame worth of packet packing (which I believe is not possible in current MAC services model), or some reasonable length such as 2 x max size frame (which I believe is achievable), or demonstrate the max range still provides fairness and provide confidence that properly (in-range value) configured nodes in a given network would not cause upper layer protcol time-outs.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Commenter fails to show a problem and did not provide sufficient remedy. Commeter is encouraged to give a presentation in 802.3cg explaining the problem.

Cl **30** *SC* **30.3.9.2.7** *P* **39** *L* **47** # i-399

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA*

aPLCABurstTimer measure bit times inside the internal process where the entire packet is transferred atomically. This is entirely (externally) invisible parameter, meaning any number of bit-times an implementation uses, it is indinguishable from other MAC transmit schedulling; therefore meaningless. IPG is generated by PLS/RS. The default value of 128 *may be* relevant if this timer is measuring the gap at the PCS. But at RS, this timer is meaningless.

SuggestedRemedy

Delete this timer.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The commenter is incorrect. The RS interfaces to the MAC layer via the PLS primitives and to the PHY via the MII interface. The RS groups and aligns the bits conveyed by the MAC via the PLS_DATA.request primitive to the MII TX_CLK (See 22.2.1.1 and 22.2.1.1.3). This mapping clarifies the specification of bit times within an RS. (see also 148.4.3.1)

Cl **30** *SC* **30.3.9.2.7** *P* **39** *L* **54** # i-52

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

comma at the end of the line is too much.

SuggestedRemedy

Remove comma at the end of the line.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **30** *SC* **30.5.1.1.2** *P* **40** *L* **17** # i-218

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Management*

The text: "10BASE-T1S Single balanced pair PHY as specified in Clause 147" does not specify the duplex modality as required.

SuggestedRemedy

Change text to: "10BASE-T1SHD Single balanced pair PHY as specified in Clause 147, half duplex mode" AND
"10BASE-T1SFD Single balanced pair PHY as specified in Clause 147, full duplex mode."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace "10BASE-T1S Single balanced pair PHY as specified in Clause 147" with 3 entries:

"10BASE-T1SHD Single balanced pair PHY as specified in Clause 147, half duplex mode"
"10BASE-T1SMD Single balanced pair PHY as specified in Clause 147, multidrop mode",
"10BASE-T1SFD Single balanced pair PHY as specified in Clause 147, full duplex mode."

Cl **45** *SC* **45.2** *P* **42** *L* **1** # i-8

Rannow, R K self

Comment Type **GR** *Comment Status* **D** *Editorial*

verbose and confusing wording throughout Subclause 45.2

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Comment is unclear as to whether it requests tutorial applications information or if specifications are missing. The change and insertion instructions are consistent with existing clause revisions in a new amendment.

Cl **45** *SC* **45.2.1.7.4** *P* **42** *L* **29** # i-219

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Management*

No entry(ies?) for 10BASE-T1 in this table

SuggestedRemedy

Seems like this is a requirement for completeness and functional management.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Bring 45.2.1.7.4 Transmit fault (1.8.11) into the draft.
Add:
Insert new row for 10BASE-T1L in Table 45-9 before row for 100BASE-T1 as shown (unchanged rows not shown):
PMA/PMD | Description location
10BASE-T1L | 146.4.2

Bring 45.2.1.7.5 Receive fault (1.8.10) into the draft.
Add:
Insert new row for 10BASE-T1L in Table 45-10 before row for 100BASE-T1 as shown (unchanged rows not shown):
PMA/PMD | Description location
10BASE-T1L | 146.4.3

Convert external references to 45.2.1.7.4 and 45.2.1.7.5 in 146.4.2 and 146.4.3 to active cross references.

Cl **45** *SC* **45.2.1.185** *P* **43** *L* **12** # i-220

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Management*

See my comment for 30.3.9.2.2. I believe there needs to be an entry here for each of the two types. 10BASE-T1S Type no longer should exist in this context.

SuggestedRemedy

Replace "10BASE-T1S" text with: "10BASE-T1SHD" AND "10BASE-T1SFD" as two separate entries, each with their own bit

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Unlike clause 30 MAU Type, the PMA/PMD type in clause 45 PMA/PMD control registers does not specify modes of the PHY separately.

Cl **45** *SC* **45.2.1.185.2** *P* **43** *L* **27** # i-221

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Management*

See my comment for 30.3.9.2.2. I believe there needs to be discussion text here for each of the two 10BASE-T1S types. 10BASE-T1S Type no longer should exist in this context.

SuggestedRemedy

Replace "10BASE-T1S" text with: "10BASE-T1SHD" AND "10BASE-T1SFD" as two separate entries, each with their own bit

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Unlike clause 30 MAU Type, the PMA/PMD type in clause 45 PMA/PMD control registers does not specify modes of the PHY separately.

Cl **45** *SC* **45.2.1.185.2** *P* **44** *L* **1** # i-222

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *PMA*

It would appear that you are dropping all of this text and table material as a single insert grouped by speed. As closely as I can tell they aren't organized this way.

SuggestedRemedy

Insert all new register descriptions and tables in a manner that is consistent with the current main standard.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The Type Selection in the referenced BASE-T1 PMA/PMD control register (Table 45-149) in the IEEE Std 802.3-2018 has has only entries, each of which is a different speed. Grouping by speed is consistent with the base standard.

Similarly, Type Selection in Table 45-7, which is analagous, is primarily grouped by speed and phy type. Since Table 45-149 is only BASE-T1 PHYs, and already grouped by type, this is also consistent.

Cl **45** *SC* **45.2.1.186a.3** *P* **45** *L* **4** # i-53

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If bit 1.2294.12 is set to one the PHY shall operate in 2.4 Vpp operating mode according to 146.5.4.1. (add comma after "one")

SuggestedRemedy

If bit 1.2294.12 is set to one, the PHY shall operate in 2.4 Vpp operating mode according to 146.5.4.1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.186a.3** *P* **45** *L* **5** # i-54

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If bit 1.2294.12 is set to zero the PHY shall operate in 1.0 Vpp operating mode according to 146.5.4.1. (add comma after "zero")

SuggestedRemedy

If bit 1.2294.12 is set to zero, the PHY shall operate in 1.0 Vpp operating mode according to 146.5.4.1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.186d.4** *P* **49** *L* **43** # i-223

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA*

Does the setting of this bit ever get changed by reset? Whichever way it works, the operation should be described.

SuggestedRemedy

Declare in the text description of the operation of 1.2297.10 whether it is affected or not by reset. If it is not, then it should also bescribed in the text of bit 1.2297.15.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

One page 49, line 45:

Replace, "The default value of bit 1.2297.10 is zero."

with, "The setting of bit 1.2297.10 is not affected by reset."

Cl **45** *SC* **45.2.1.186d.5** *P* **49** *L* **52** # i-55

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

When in loopback the 10BASE-T1S PHY ... (add comma after "loopback")

SuggestedRemedy

When in loopback, the 10BASE-T1S PHY ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.186e.1** *P* **51** *L* **16** # i-404

Kim, Yongbum NIO

Comment Type **ER** *Comment Status* **D** *Multidrop*

The word "multi-drop" is a new term that does not convey any different meaning than "[half-duplex] [shared] mixing segment" as opposed to "[point to point] link segment". There is no reason to introduce a new term that does not convey anything new.

SuggestedRemedy

Delete the use of "multi-drop" here and the rest of the draft, and use existing "half-duplex", "shared medium", "mixing segment", etc, as appropriate. OR, clearly define what is different about the use of "multi-drop".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Multidrop is only used in the draft for the name of the shared-medium mode of Clause 147 PHYs as "multidrop mode" (the term "multi-drop" is not used), and is defined at the start of clause 147 (page 167, line 15 "a half-duplex shared-medium mode, referred to as multidrop mode, capable of operating with multiple stations connected to a mixing segment, defined in 147.8."). No further description is needed, and it is not synonymous with any of the terms suggested by the commenter.

Cl **45** *SC* **45.2.3.68a** *P* **52** *L* **41** # i-224

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Registers*

Add "normal operation" text to description to match the last clause of the the text above.

SuggestedRemedy

Change text "Disable loopback mode" to "Disable loopback mode, normal operation"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Text is consistent with all other "loopback mode" entries in IEEE Std 802.3. See, e.g., Table 45-4, bit 1.0.0.

Whether normal operation is, in fact, in order is subject to other controls. For example, test modes would prohibit normal operation, even though loopback was disabled.

Cl **45** *SC* **45.2.3.68b.5** *P* **54** *L* **40** # i-405

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *Registers*

"Fault -- Fault condition
detected.. " is just too vague. Does reader assume the "fault" relates to PCS fault? And is it any detectable fault? Any implementation specific faults? So if I read this latched bit as one, what information do I get -- there was a fault and we don't know what caused it. So what value is there? Makes little sense. I cannot even suggest wording that may be satisfactory.

SuggestedRemedy

Assuming this is PCS fault TX or RX.. Reference detected fault types in relevant PCS clauses. If this is just thrown in for any fault and .3cg want it, then say "ANY DETECTED PCS FAULT". If there is no agreement how this is used, then I suggest deleting it.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Text is consistent with specification for PMA and PCS faults in IEEE Std 802.3.

See, e.g., 45.2.1.2.3 Fault (1.1.7) for PMA/PMD faults, or 45.2.3.2.5 Fault (3.1.7), for the corresponding PCS fault.

Cl **45** *SC* **45.2.3.68c** *P* **55** *L* **5** # i-225

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Registers*

The text here says that "The default value for each bit of the ... control register should be chosen so that the initial state of the device upon power up or reset is a normal operational state without management intervention." It is not well placed or a requirement nor is it reflected in the table definitions.

SuggestedRemedy

There needs a) to be a "shall" statement b) so that there will be a corresponding entry in the PICS Pro Forma, c) placed so the text applies to the entire device below the MII and d) reflected with a default value declaration for each bit in each control register.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The statement is consistent in placement and wording with similar statement in similar control registers in Clause 45 of IEEE Std 802.3-2018. Like these registers, the 10BASE-T1S PCS control register controls test modes, and the statement is advisory. IEEE Std 802.3-2018 does not require this with a 'shall' statement, as the commenter suggests.

Cl **45** *SC* **45.2.3.68c.1** *P* **55** *L* **23** # i-226

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Registers*

The text description here and its corresponding table entry are confusing. If (as described in the table) this bit is self-clearing (as described in the table) then the text should indicate that in the description and the penultimate sentence should be modified. If the bit is not self clearing then the SC should be removed from the table.

SuggestedRemedy

Modify text and table contents so that they are fully descriptive and consistent.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Commenter is incorrect. The text indicates that the bit is self-clearing at page 55, line 28, "This bit is self-clearing and the 10BASE-T1S PCS shall return a value of one in bit 3.2291.15 when a reset is in progress; otherwise, it shall return a value of zero."

Cl **45** *SC* **45.2.3.68c.2** *P* **55** *L* **40** # i-227

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PMA*

We had discussions in the TF that the conventional wisdom is to place the loopback as close to the MDI as possible in order to test as much of the circuitry as possible (even though that can be an additional technical challenge).

SuggestedRemedy

Add informative text to this paragraph about the desirability of having the loopback close to the MDI. (I might be talked out of this being a REQUIRED comment)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Implementation-specific tutorial guidance is inappropriate for the standard.

Note that this is a PCS loopback, so any loopback would not necessarily be close to the MDI.

Cl **45** *SC* **45.2.3.68c.3** *P* **56** *L* **5** # i-199

Griffiths, Scott Rockwell Automation

Comment Type **E** *Comment Status* **D** *Editorial*

Bit 3.0.8 is defined as reserved with a value of always zero in 802.3-2018. Is this the correct reference?

SuggestedRemedy

Correct reference or remove line.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace "3.0.8" with "0.8 (see Table 22-7)"

Cl **45** *SC* **45.2.3.68e** *P* **56** *L* **41** # i-228

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Registers*

Add a "Non Wrapping" desgnation to the table for added clarity and to match the text.

SuggestedRemedy

Add "NW" to the right hand cell and "NW = Non-Wrapping" to footnote a. Do the same for other non-wrapping counters.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

There are no other "NW" designations in IEEE Std 802.3-2018, nor are there designations for wrapping counters.

Standard practice is to describe wrapping behavior in the text of the bit.

Cl **45** *SC* **45.2.3.68d.1** *P* **57** *L* **32** # i-406

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA*

The concern is where entire function of PLCA resides. Is it just in RS (CL148)? Or is there PLCA mandatory components in PCS and/or PMA? This specification indicates that [optional] PLCA RS resides in PCA and PMA, requiring features otherwise not required for non-PLCA implementations.

10BASE-T1S PCS contains PLCA components that are optional. This is entirely inconsistent with PLCA is a optional function in RS layer. It looks to be that PLCA is also an optional function in PCS layer. If this is the case, the standard should state this. And if the PLCA is also an optional function in PMA layer, it
should also be stated as such.

SuggestedRemedy

Either delete this PLCA Support in PCS/PMA and other PCS/PMA clauses, or clarify which layer(s), the optional PLCA function resides\, besides stated CL148 RS.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The referenced text is purely a detection that the transmitted signal is not corrupted and is entirely in Clause 147 PCS/PMA and does not represent PLCA function. It is not strictly PLCA support, and is not PLCA function. It may be useful for a variety of debugging purposes, including, but not limited to, when the clause 148 PLCA is used.

Cl **45** *SC* **45.2.7.25** *P* **58** *L* **7** # i-229

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Registers*

This "mode" is not supported in the current standard or any current project or proposal.

SuggestedRemedy

Add the following text to the end of the description: "(RESERVED, Not currently supported)"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This isn't a mode. Bit 7.526.15 controls the autonegotiation advertisement of 10BASE-T1L. Because 10BASE-T1L is full duplex, the advertised ability for 10BASE-T1L is appropriately called "10BASE-T1L full duplex ability". Commenter appears to be misreading a "10BASE-T1L half duplex ability", which does not exist into the "does not support" advertisement setting.

Cl **45** *SC* **45.2.3.68f** *P* **58** *L* **19** # i-408

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *MDI*

"...MDI". There is no definition of MDI in CL147 that this refers to. Medium Dependant Interface, MDI, is an accepted interoperability interface. Optional-use connectors in CL147 are not MDI, unless it states the normative nature of the connector.

SuggestedRemedy

Either provide alternate referece to the medium connection point, or define nomative MDI in CL147.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Commenter is incorrect. The MDI is a defined interface point in Clause 147. See figure 147-1. A connector at the MDI may or may not be defined (and this varies in other IEEE Std 802.3 clauses), but the MDI remains at the plane of connection to the medium. See Figure 147-1. Additionally, electrical and tolerance characteristics of the MDI are specified in 147.9.2, 147.9.3, and 147.9.4.

Cl **45** *SC* **45.2.3.68f** *P* **58** *L* **24** # i-407

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA*

CorruptedTxCnt is defined as "16 bits field counting each time a transmission initiated locally results in a corrupted signal at
the MDI since last read of this register". This counter has several issues. It is not clear whether this counter is to count 1) every bit error (bit-by-bit comparison), 2) every error event (burst error event), or 3) every packet error event. Also "transmission initiated locally" is not clear. Assuming this means local node transmitting, does it apply to packets, BEACON and other signals? And is it bit-by-bit, or burst or symbol or packet or other error events?

SuggestedRemedy

Please clarify what "corruption" event this counter is counting, and reference where in the CL147 specification the event-to-be-counted resides (to assure proper formal reference to the event(s)).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "Bits 3.2294.15:0 count up each time a transmission initiated locally results in a corrupted signal at the MDI."

with,
"Bits 3.2294.15:0 count up at each positive edge of the MII signal COL."

Cl **45** *SC* **45.2.7.25.1** *P* **58** *L* **35** # i-230

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *AutoNeg*

I don't understand the purpose of this text.

SuggestedRemedy

Relace with: "If bit 7.526.15 is set to one the PHY shall advertise 10BASE-T1L full duplex capability. If bit 7.526.15 is set to zero, the PHY shall advertise is does not operate as a compliant 10BASE-T1L device."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(Note:change is aligned with similar text in 45.2.7.10.x)

Replace, "Bit 7.526.15 is used to select whether or not Auto-Negotiation advertises the ability to operate the 10BASE-T1L PHY in full duplex mode. If bit 7.526.15 is set to one the PHY shall advertise 10BASE-T1L full duplex capability. If bit 7.526.15 is set to zero, the PHY shall not advertise the ability to operate in 10BASE-T1L full duplex mode."

with, "Bit 7.526.15 is used to select whether or not Auto-Negotiation advertises the ability to operate as a 10BASE-T1L PHY. If bit 7.526.15 is set to one the PHY shall advertise 10BASE-T1L full duplex capability. If bit 7.526.15 is set to zero, the PHY shall not advertise the ability to operate in 10BASE-T1L full duplex PHY capability."

Cl **45** *SC* **45.2.7.25.4** *P* **59** *L* **6** # i-56

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If bit 7.526.12 is set to one the PHY shall advertise a request to operate the 10BASE-T1L PHY in increased transmit level mode. (add comma after "one")

SuggestedRemedy

If bit 7.526.12 is set to one, the PHY shall advertise a request to operate the 10BASE-T1L PHY in increased transmit level mode.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.25.5** *P* **59** *L* **13** # i-57

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If bit 7.526.7 is set to one the PHY shall advertise 10BASE-T1S full duplex capability. (add comma after "one")

SuggestedRemedy

If bit 7.526.7 is set to one, the PHY shall advertise 10BASE-T1S full duplex capability.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.25.6** *P* **59** *L* **20** # i-58

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If bit 7.526.6 is set to one the PHY shall advertise 10BASE-T1S half duplex capability. (add comma after "one")

SuggestedRemedy

If bit 7.526.6 is set to one, the PHY shall advertise 10BASE-T1S half duplex capability.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.9.2.7** *P* **62** *L* **25** # i-17

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *EZ*

As pointed out in Comment #7 against D2.3, in the editing instruction "42.2.9.2.7 " should be "45.2.9.2.7" (45 instead of 42)

SuggestedRemedy

In the editing instruction, change: "42.2.9.2.7 " to "45.2.9.2.7"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.5.3.3** *P* **64** *L* **17** # i-231

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Registers*

The default states do not appear in the table for the referenced items. The PICS entries Y and N/A do not appear to me reference the univers of possibilities.

SuggestedRemedy

Expand answer table and indicate default values in the relevant register tables.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Proposed remedy is unclear as to what entries are requested.

PICS entry for referenced text is is consistent with practice in IEEE Std 802.3 clause 45. Reporting of default values is consistent with practice and style of Clause 45. Default values are generally not listed in PICS tables, but are in text of clause 45 subclauses.

Cl **45** *SC* **45.5.3.3** *P* **65** *L* **8** # i-59

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

... using 1 Vpp operating mode (the name of the operating mode is 1.0 Vpp operating mode)

SuggestedRemedy

... using 1.0 Vpp operating mode

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Provide editorial license to change all instances of "1 Vpp operating mode" to "1.0 Vpp operating mode",

including those listed below and:
P65 L8 (45.5.3.3)
P150 L44 and L46 (Table 146-5)
P165 L30 (146.11.4.4, Item LMF1 Feature)

Cl **45** *SC* **45.5.3.7** *P* **68** *L* **44** # i-60

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

Support tick boxes for RM172 are missing.

SuggestedRemedy

Please add "Yes [ ]" and "N/A [ ]" into the support field for RM172.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **78** *SC* **78.2** *P* **71** *L* **32** # i-61

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *EEE*

Modify the key EEE parameters in Table 78-2 for 10BASE-T1L to support a wider range of implementations.

SuggestedRemedy

Use the following values within Table 78-2 for 10BASE-T1L: Ts,min: 250 us, Ts,max: 250 us, Tq,min: 6000 us, Tq,max: 6000 us, Tr,min: 250 us, Tr,max: 250 us

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **78** *SC* **78.2** *P* **71** *L* **32** # i-314

Kabra, Lokesh Synopsys, Inc.

Comment Type **G** *Comment Status* **D** *EEE*

The quiet time Tq specified (6000 usec) corresponds to around 5 max-sized (1518 Bytes) packets in 10 Mb/s. This ratio (Tq to Tr) seems to be very low as compared to the quiet times specified for 100 or 1000 Mb/s (in terms of max-sized packets)

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.

Cl **78** *SC* **78.5** *P* **71** *L* **49** # i-315

Kabra, Lokesh Synopsys, Inc.

Comment Type **T** *Comment Status* **D** *EEE*

As per equations given in Figure 78-5 of 802.3-2018, Tw_sys_tx(min) = Tw_sys_rx(min) + Tphy_shrink_tx(max) + Tphy_shrink_rx(max)". The values given in Table 78-4 does not satisfy this equation

SuggestedRemedy

Change value for Tw_sys_tx from 220 to 450

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accomodated by comment i-62.

Response to comment i-62 is:

PROPOSE ACCEPT.
Use the following values within Table 78-4 for 10BASE-T1L: Tw_sys_tx: 270 us, Tw_phy: 250.5 us, Tphy_shrink_tx: 10 us, Tphy_shrink_rx: 240 us, Tw_sys_rx: 20 us

Cl **78** *SC* **78.5** *P* **71** *L* **49** # i-62

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *EEE*

Correct and modify the LPI timing parameters for 10BASE-T1L in Table 78-4 to support a wider range of implementations.

SuggestedRemedy

Use the following values within Table 78-4 for 10BASE-T1L: Tw_sys_tx: 270 us, Tw_phy: 250.5 us, Tphy_shrink_tx: 10 us, Tphy_shrink_rx: 240 us, Tw_sys_rx: 20 us

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.2.1** *P* **72** *L* **10** # i-33

Yseboodt, Lennart Signify

Comment Type **T** *Comment Status* **D** *AutoNeg*

"Two different Auto-Negotiation speeds are defined in this subclause. A PHY shall support at least one of these Auto-Negotiation speeds."
and
"If Auto-Negotiation is implemented, 1000BASE-T1, 100BASE-T1, and 10BASE-T1S PHYs shall support HSM and may optionally support LSM."

I assume that support for Autoneg is optional. If this is the case, then the first requirement will need a qualifier. As-is, every PHY is required to support at least on Autoneg speed.

SuggestedRemedy

Change first quoted snippet to:
"Two different Auto-Negotiation speeds are defined in this subclause. If Auto-Negotiation is implemented, a PHY shall support at least one of these Auto-Negotiation speeds."

Possibly you may want to change "a PHY" into something more specific, given that this paragraph deals only with 10SPE ?

Proposed Response *Response Status* **W**

PROPOSED REJECT.

While auto-negotiation is optional, when it is not implemented, Clause 98 compliance is not required at all. Hence a statement in clause 98 which says "when auto-negotiation is not implemented" is moot.

Cl **98** *SC* **98.2.1.1.2** *P* **72** *L* **27** # i-34

Yseboodt, Lennart Signify

Comment Type **E** *Comment Status* **D** *Editorial*

"The timing parameters for DME pages shall be followed as in Table 98-1."

Bad English.

SuggestedRemedy

"The timing parameters of the DME pages shall conform to Table 98-1."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment is against text that is not changed by this amendment. The commenter is encouraged to submit a Maintenance request.

Cl **98** *SC* **98.2.1.1.2** *P* **72** *L* **30** # i-35

Yseboodt, Lennart Signify

Comment Type **T** *Comment Status* **D** *Editorial*

"When operating in high-speed mode, the period, T1, shall be 30.0 ns +- 0.01%."
and
"When operating in low-speed mode, the period, T1, shall be 800 ns +- 0.005%."

This requirement is already specified in Table 98-1 and made a requirement by a previous shall statement.
Not only are both of these sentences redundant, they also copy the value of a parameter out of Table 98-1 and present it in a different way.

SuggestedRemedy

Remove both sentences. Add "When operating in high|low speed mode," to the sentences that specify when transitions occur (or add this parameter to the Table).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace the last 4 sentences in clause 98.2.1.1.2 (starting with, "TWhen operating in) with,

"The period, T1, shall be 30.0ns ± 0.01%.Transitions shall occur within ±0.8 ns of their ideal positions." shown in strikethough followed by,

"When operating in low-speed mode, transitions shall occur within ± 0.8 ns of their ideal positions. When operating in high-speed mode, transitions shall occur within ± 10 ns of their ideal positions." shown in underline.

Cl **98** *SC* **98.2.1.1.2** *P* **73** *L* **6** # i-36

Yseboodt, Lennart Signify

Comment Type **E** *Comment Status* **D** *EZ*

Last column "Units" is broken at the last letter.

SuggestedRemedy

Increase column width slightly.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.1** *P* **73** *L* **44** # i-325

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

The editing instruction reads 'Insert variable for autoneg_speed after the variable for an_receive_idle ...' yet the variable is called ANSP.

SuggestedRemedy

Suggest that the editing instruction be changed to read 'Insert the variable ANSP after the variable an_receive_idle ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "Insert variable for autoneg_speed after the variable for an_receive_idle as follows:"

with, "Insert variable for ANSP after the variable for an_receive_idle as follows:

Cl **98** *SC* **98.5.1** *P* **73** *L* **45** # i-326

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Suggest that the ANSP variable is formatted in the same way as other variables in this subclause.

SuggestedRemedy

Suggest that the ANSP valuable be formatted to read as follows:

ANSP
This variable contains the type of the selected Auto-Negotiation speed.
Values:
HSM: high-speed mode.
LSM: low-speed mode.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **98** *SC* **98.5.1** *P* **73** *L* **46** # i-159

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **T** *Comment Status* **D** *Editorial*

The editing instruction refers to a variable autoneg_speed, but the variable is ANSP. This variable is also referred to by autoneg_speed in 98.5.1

SuggestedRemedy

Change editing instruction on P 73 L44 from "Insert variable for autoneg_speed after the variable for an_receive_idle as follows:" to "Insert variable for ANSP after the variable for an_receive_idle as follows:" and change autoneg_speed in 98.5.6.1 (P81 L17) to ANSP, and change the two references in Figure 98-11, P82 L22 from autoneg_speed to ANSP.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change editing instruction on P 73 L44 from "Insert variable for autoneg_speed after the variable for an_receive_idle as follows:" to "Insert variable for ANSP after the variable for an_receive_idle as follows:" and

Page 80, line 50: Change '... through the variable autoneg_speed and ...' to read '... through the variable ANSP and ...'.

Page 81, line 17: change autoneg_speed in 98.5.6.1 to ANSP, and

Figure 98-11 (Page 82 line 22): change the two references in Figure 98-11, P82 L22 from autoneg_speed to ANSP.

Cl **98** *SC* **98.5.1** *P* **73** *L* **46** # i-63

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Editorial*

ANSP is the abbreviation for autoneg_speed in the state diagrams, the variable name itself has to be autoneg_speed.

SuggestedRemedy

Change ANSP to autoneg_speed and define within a new paragraph ANSP - ANSP is an abbreviation for the variable autoneg-speed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accomodated by comment i-159.

The resolution to comment i-159 is:

Change editing instruction on P 73 L44 from "Insert variable for autoneg_speed after the variable for an_receive_idle as follows:" to "Insert variable for ANSP after the variable for an_receive_idle as follows:" and

Page 80, line 50: Change '... through the variable autoneg_speed and ...' to read '... through the variable ANSP and ...'.

Page 81, line 17: change autoneg_speed in 98.5.6.1 to ANSP, and

Figure 98-11 (Page 82 line 22): change the two references in Figure 98-11, P82 L22 from autoneg_speed to ANSP.

Cl **98** *SC* **98.5.1** *P* **73** *L* **53** # i-64

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

Condition that is true until such time as the power supply ... (redundant wording)

SuggestedRemedy

Condition that is true until the power supply ...

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The phrase "Condition that is true until such time" is consistent with all similar statements in 802.3-2018.

Cl **98** *SC* **98.5.2** *P* **74** *L* **29** # i-282

McCarthy, Mick Analog Devices Inc.

Comment Type **TR** *Comment Status* **D** *AutoNeg*

For 10BASE-T1L and 10BASE-T1S, the break_link_timer_[HSM] duration is too short to ensure that the link partner will enter a Link Fail state.

For 10BASE-T1S, this is related to heartbeat transmission of SC 147.3.7.

For 10BASE-T1L, this is related to the lpi_quiet_timer and possibly also the silent_timer (which dictate normal periods of silence).

SuggestedRemedy

Change break_link_timer_[HSM] description as follows:

Timer for the amount of time to wait in order to assure that the link partner enters a Link Fail state.
For all PHY types except 10BASE-T1S and 10BASE-T1L, this timer shall expire 300 us to 305 us after being started.
For a 10BASE-T1S PHY, this timer shall expire 400 ms to 405 ms after being started.
For a 10BASE-T1L PHY, this timer shall expire 150 ms to 155 ms after being started.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve with comment 1-283.

On page 74, line 31, 2nd sentence of break_link_timer_[HSM] description:

Replace, "The timer shall expire 300 µs to 305 µs after being started."

with, "For PHY types operating data rates at greater than 10 Mb/s, this timer shall expire 300 us to 305 us after being started."

Add new third and fourth sentences to the break_link_timer_[HSM] description as follows: "For a 10BASE-T1S PHY, this timer shall expire 400 ms to 405 ms after being started. For a 10BASE-T1L PHY, this timer shall expire 150 ms to 155 ms after being started."

Cl **98** *SC* **98.5.2** *P* **75** *L* **42** # i-283

McCarthy, Mick Analog Devices Inc.

Comment Type **TR** *Comment Status* **D** *AutoNeg*

For 10BASE-T1L and 10BASE-T1S, the break_link_timer_[LSM] duration is too short to ensure that the link partner will enter a Link Fail state.

For 10BASE-T1S, this is related to heartbeat transmission of SC 147.3.7.

For 10BASE-T1L, this is related to the lpi_quiet_timer and possibly also the silent_timer (which dictate normal periods of silence).

SuggestedRemedy

Change break_link_timer_[LSM] description as follows:

Timer for the amount of time to wait in order to assure that the link partner enters a Link Fail state.
For all PHY types except 10BASE-T1S and 10BASE-T1L, this timer shall expire 300 us to 305 us after being started.
For a 10BASE-T1S PHY, this timer shall expire 400 ms after being started.
For a 10BASE-T1L PHY, this timer shall expire 150 ms after being started.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve with comment 1-282.

On page 74, line 31, 2nd sentence of break_link_timer_[HSM] description:

Replace, "The timer shall expire 300 µs to 305 µs after being started."

with, "For PHY types operating data rates at greater than 10 Mb/s, this timer shall expire 300 us to 305 us after being started."

Add new third and fourth sentences to the break_link_timer_[HSM] description as follows: "For a 10BASE-T1S PHY, this timer shall expire 400 ms to 405 ms after being started. For a 10BASE-T1L PHY, this timer shall expire 150 ms to 155 ms after being started."

Cl **98** *SC* **98.5.2** *P* **76** *L* **40** # i-65

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

3030 to 3090 ms (add unit "ms" after 3030)

SuggestedRemedy

3030 ms to 3090 ms

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "3030 to 3090 ms"

with, "3030 ms to 3090 ms"

Cl **98** *SC* **98.5.5** *P* **77** *L* **19** # i-327

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

The variable multispeed_autoneg_reset is used in Figure 98-7 'Arbitration state diagram' but is not defined in subclause 98.5.1 'State diagram variables'.

SuggestedRemedy

Add the following variable definition to subclause 98.5.1:

multispeed_autoneg_reset
See 98.5.6.1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.5** *P* **77** *L* **23** # i-328

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

There is no transition condition on the transition from the AN ENABLE state to the TRANSMIT DISABLE state. I note that the condition on the same transition in IEEE Std 802.3-2018 is mr_autoneg_enable = true, however since mr_autoneg_enable = false is an open arrow condition to the AN ENABLE state, the condition seems redundant, so I assume was removed to indicate an unconditional transition. If that is the case the transition should be marked with UCT (see IEEE Std 802.3-1018 subclause 21.5.3).

SuggestedRemedy

Mark the transition from the AN ENABLE state to the TRANSMIT DISABLE state, on exit from the AN ENABLE state, with 'UCT'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

On page 77, line 23: Mark the transition from the AN ENABLE state to the TRANSMIT DISABLE state, on exit from the AN ENABLE state, with 'UCT'.

On page128, line 47: Change the RSTCD condition to an UCT condition between states DATA and DATA_ERR

Cl **98** *SC* **98.5.5** *P* **77** *L* **25** # i-329

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

There is an imbalance in the number of brackets on the transition condition from the COMPLETE ACKNOWLEDGE state to the NEXT PAGE WAIT.

SuggestedRemedy

Suggest that '... ((tx_link_code_word[NP] = 1) + (np_rx = 1)' should read '... ((tx_link_code_word[NP] = 1) + (np_rx = 1))'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.5** *P* **77** *L* **26** # i-330

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *State Diagram*

It is not clear to me why the mr_autoneg_enable variable would be set to true in the AN GOOD CHECK state. It is not possible to transition into the AN GOOD CHECK state if the mr_autoneg_enable variable is not already set to true due to the open arrow entry into the AN ENABLE state based on mr_autoneg_enable = false. In addition, mr_autoneg_enable is a register bit sourced from bit 7.512.12 Auto-Negotiation enable (see Table 98-7) so I don't see why this state diagram would want to overwrite the value sourced by the management entity in the register bit.

Finally, on review of the IEEE Std 802.3-2018 Arbitration state diagram I don't see this action in the AN GOOD CHECK state, but instead, I see the action link_control_[notHCD] <= DISABLE. I can see why that might have been removed as the only way to get to the AN GOOD CHECK state is from the COMPLETE ACKNOWLEDGE state from the ACKNOWLEDGE DETECT state where link_control_[all] <= DISABLE is one of the actions. But this doesn't explain the addition of the action mr_autoneg_enable = true.

SuggestedRemedy

Remove the action mr_autoneg_enable = true from the AN GOOD CHECK state.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.5** *P* **78** *L* **37** # i-331

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *EZ*

Typo, the transition condition from the WAIT 2 state to the TRANSMIT COUNT ACK state should read 'transmit_DME_wait = false', that is the Assignment (<=) should be an Equals (=).

SuggestedRemedy

Suggest that 'transmit_DME_wait <= false' should read 'transmit_DME_wait = false'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.5** *P* **78** *L* **38** # i-332

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *EZ*

Round brackets are normally used to indicate precedence (see IEEE Std 802.3-2018 subclause 21.5.4 'Operators'), square brackets are usually used to denote bit ranges.

SuggestedRemedy

Suggest that 'tx_link_code_word(tx_bit_cnt)' should read 'tx_link_code_word[tx_bit_cnt]'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.6.1** *P* **81** *L* **14** # i-333

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

A minor point, but all other variables in subclause 98.5 use lowercase 'true' and false'.

SuggestedRemedy

Suggest that 'TRUE' be changed to 'true' and 'FALSE' be changed to 'false' here and throughout subclause 98.5.6.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace "TRUE" with "true" in these locations:
page 81, line 10
page 81, line 15
page 81, line 33
page 81, line 36
page 81, line 39
page 81, line 44
page 82, in the SPEED DETECTION box in Figure 98-11

Replace "FALSE" with "false" in these locations:
page 81, line 14
page 81, line 16
page 81, line 36
page 81, line 37
page 81, line 43
page 81, line 44
page 82, in the LOW-SPEED AN box in Figure 98-11
page 82, in the HIGH-SPEED AN box in Figure 98-11

Cl **98** *SC* **98.5.6.1** *P* **81** *L* **17** # i-334

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

The variable autoneg_speed used in figure 98-11 is defined here by reference to subclause 98.5.1, yet I can't find a variable autoneg_speed defined in subclause 98.5.1. Based on the assignments of autoneg_speed to HSM and LSM in the HIGH-SPEED and LOW-SPEED states respectively, I suspect that autoneg_speed has been changed to ANSP in subclause 98.5.1.

SuggestedRemedy

Suggest that the following changes are made:
[1] Page 80, line 50: Change '... through the variable autoneg_speed and ...' to read '... through the variable ANSP and ...'.
[2] Page 81, line 17: Change 'autoneg_speed' to read 'ANSP'.
[3] Page 82, line 22: Change 'autoneg_speed <= HSM' to read 'ANSP <= HSM' in the HIGH-SPEED state.
[4] Page 82, line 22: Change 'autoneg_speed <= LSM' to read 'ANSP <= LSM' in the LOW-SPEED state.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accomodated by comment i-159.

The Response to Comment i-159 is:

PROPOSED ACCEPT IN PRINCIPLE.
Change editing instruction on P 73 L44 from "Insert variable for autoneg_speed after the variable for an_receive_idle as follows:" to "Insert variable for ANSP after the variable for an_receive_idle as follows:" and

Page 80, line 50: Change '... through the variable autoneg_speed and ...' to read '... through the variable ANSP and ...'.

Page 81, line 17: change autoneg_speed in 98.5.6.1 to ANSP, and

Figure 98-11 (Page 82 line 22): change the two references in Figure 98-11, P82 L22 from autoneg_speed to ANSP.

Cl **98** *SC* **98.5.6.3** *P* **81** *L* **45** # i-335

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

Operation of the timers, such as the meaning of start timer, stop time and timer_done, should be defined by reference to the subclause 40.4.5.2.

SuggestedRemedy

Suggest the text 'All timers operate in the manner described in 40.4.5.2.' is inserted as the first paragraph of this subclause.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.6.3** *P* **81** *L* **51** # i-336

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *State Diagram*

The 'timer value' for the detection_timer is defined as (2.5 ms +/- 0.1 ms) + (random integer from 0 to 15) x (0.5 ms +/- 0.05 ms). Based on this the minimum value is 2.5 ms - 0.1 ms = 2.4 ms and the maximum is (2.5 ms + 0.1 ms) + (15 x (0.5 ms + 0.05 ms)) = 10.85 ms. It would, therefore, seem to imply that a fixed value between 2.4 ms and 10.85 ms can be chosen for the time. I suspect that this is not what is intended, and instead, the random number needs to be selected each time the time is restarted.

SuggestedRemedy

Suggest that the text 'A new random integer from 0 to 15 inclusive is generated every time the detection_timer is started. The random value should be uniformly distributed.' is added to the end of the 'Timer value' text.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.6.3** *P* **81** *L* **54** # i-66

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

under laying (correct spelling)

SuggestedRemedy

underlying

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accomodated by comment i-158.

The resolution to comment i-158 is:

Change "under laying" to "underlying"

Cl **98** *SC* **98.5.6.2** *P* **81** *L* **54** # i-158

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *EZ*

"under laying" should be "underlying"

SuggestedRemedy

Change "under laying" to "underlying"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.5.6.3** *P* **82** *L* **5** # i-337

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *EZ*

The variable pwr_on on the open arrow entry to the state SEED DETECTION should be power_on, see subclause 98.5.6.1.

SuggestedRemedy

Change 'pwr_on + mr_main_reset + ...' to read 'power_on + mr_main_reset + ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **98** *SC* **98.6.8** *P* **85** *L* **13** # i-67

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

0.005 % (remove space acc. to style guide requirements)

SuggestedRemedy

5e-05

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "0.005 %"

with, "0.005%"

Cl **104** *SC* **104** *P* **86** *L* **1** # i-37

Yseboodt, Lennart Signify

Comment Type **TR** *Comment Status* **D** *PoDL*

After reviewing 146.8.4 I realized that PoDL's PSE spec does not include a voltage polarity requirement.
The PD section does not specify whether PDs need to be polarity insensitive, or what the expected pinout is either.

SuggestedRemedy

Add a subsection with appropriate requirements for the PSE and PD that specifies output/input voltage polarity (possibly linked only to 10SPE and/or the listed IEC connectors there).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Task Force to discuss. (TFTD)

In Figure 104-3, replace MDI+ with BI_DA+ and replace MDI- with BI_DA-

Add sub-clause 104.4.1
"104.4.1 PI pin assignments
A PSE provides power via a single two wire connection. Table 104-1a in conjunction with Figure 104-3 illustrates the PSE pinout.

A PSE shall implement the PSE pinout in Table 104-1a.

Table 104-1a - PSE Pinout
{
{ {{Contact} {PI} }
{ {1} {PI+} }
{ {2} {PI-} }
}
"

Add sub-clause 104.5.1
"104.5.1 PD PI
A PD may receive power in two modes, Mode A and Mode B. Table 104-4a in conjunction with Figure 104-3 illustrates the PD pinout.

Table 104-4a - PD Pinout
{
{ { Contact} {Mode A} {Mode B} }
{ {1} {PI+} {PI-} }
{ {2} {PI-} {PI+} }
}

Option 1:

Class 0 to class 9 PDs shall be able to operate per the Mode A column in Table 104-4a. Class 10 to class 18 PDs shall be implemented to be insensitive to the polarity of the power supply and shall be able to operate per the Mode A column and the Mode B column in Table 104-4a.

Option 2:

PDs shall be able to operate per the Mode A column in Table 104-4a.

Cl **104** *SC* **104.1.3** *P* **86** *L* **15** # i-322

Stewart, Heath Analog Devices Inc.

Comment Type **TR** *Comment Status* **D** *PoDL*

Clause 104.1.3 states that "PoDL systems are not specified for mixing segments". As such 10BASE-T1S PHYs cannot be correlated with a PoDL Type.

SuggestedRemedy

Change
"A Type A or Type C PSE and Type A or Type C PD is compatible with 10BASE-T1S and 100BASE-T1 PHYs... A Type C PSE and Type C PD is compatible with 10BASE-T1S, 100BASE-T1, and 1000BASE-T1 PHYs..."
To
"A Type A or Type C PSE and Type A or Type C PD is compatible with 100BASE-T1 PHYs... A Type C PSE and Type C PD is compatible with 100BASE-T1, and 1000BASE-T1 PHYs..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace,
"A Type A or Type C PSE and Type A or Type C PD is compatible with 10BASE-T1S and 100BASE-T1 PHYs."

with,
"A Type A or Type C PSE and Type A or Type C PD is compatible with 100BASE-T1 PHYs."

Replace,
"A Type C PSE and Type C PD is compatible with 10BASE-T1S, 100BASE-T1, and 1000BASE-T1 PHYs."

with,
"A Type C PSE and Type C PD is compatible with 100BASE-T1 and 1000BASE-T1 PHYs..."

(Editor's note: Unecessary comma after 100BASE-T1 in second change removed.)

Cl **104** *SC* **104.1.3** *P* **86** *L* **16** # i-292

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **E** *Comment Status* **D** *Editorial*

The relation of PHYs and PoDL System types is extremely difficult to follow

SuggestedRemedy

separate the sentences with bullet points (cannot be shown here)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment affects text and sentence structure that is not changed by this amendment. The commenter is encouraged to submit a Maintenance request.

Cl **104** *SC* **104.2** *P* **86** *L* **26** # i-293

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **E** *Comment Status* **X** *Editorial*

The relation of loop resistance and PoDL class types is extremely difficult to follow

SuggestedRemedy

separate the sentences with bullet points (cannot be shown here) and change loop resistances (another comment)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment affects text and sentence structure that is not changed by this amendment. The commenter is encouraged to submit a Maintenance request. The response to the proposal to change the loop resistances is capture in the response to comment i-295.

Cl **104** *SC* **104.2** *P* **86** *L* **28** # i-321

Stewart, Heath Analog Devices Inc.

Comment Type **TR** *Comment Status* **D** *PoDL*

*** Comment submitted with the file 100635300003-stewart_3cg_01_0519_v1.pdf attached ***

Clause 104 modifications are required to correct the dc loop resistance for 10BASET1L channels. Classes enabling 24V nominal, 50V max and SELV max are proposed. Class related parameters and encodings changes which derive from these corrections are also proposed.

SuggestedRemedy

See stewart_3cg_01_0519

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Task Force to discuss (TFTD) changes proposed in: http://www.ieee802.org/3/cg/comments/Comment_i-321_Stewart_3cg_clause_104_modifications_v1.pdf

(Note: Specific agreed upon text and table changes will need to be documented in this proposed response. A reference to a contribution is not an acceptable response for SA ballot.)

Cl **104** *SC* **104.3** *P* **87** *L* **4** # i-294

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *PoDL*

Table 104-1a needs changes: 1-classes 10-12 for 36 V are outdated and should be deleted. 2-one more 60V class should be added

SuggestedRemedy

1-classes 10-12 for 36 V are outdated and should be deleted. 2-one more 60V class should be added

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accomodated by comment i-321.

Response to comment i-321 is:

(Note: Editor to copy response to comment i-321 here.)

Cl **104** *SC* **104.3** *P* **87** *L* **19** # i-68

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

Cable mm (AWG) (from the text it is not clear that the "mm" means the diameter)

SuggestedRemedy

Cable diameter in mm (AWG)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "Cable mm (AWG)"

with,

"Cable diameter in mm (AWG)"

Cl **104** *SC* **104.3** *P* **87** *L* **19** # i-295

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *PoDL*

In Table 104-1a cable related limits are specified in he last two lines. As this is outside scope it should be replaced just by the loop resistance, giving the IEC cable group the task to define the cables. In Annex 146B there is an informative Table 146B-1 showing a lot of details.

SuggestedRemedy

The new classes 10 to 13 should show in the last row 9.25; 15; 25; 65 Ohm loop resistance at 60 C

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accomodated by comment i-321.

Response to comment i-321 is:

(Note: Editor to copy response to comment i-321 here.)

Cl **104** *SC* **104.4.1** *P* **87** *L* **30** # i-69

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

For PoDL systems there are multiple types of PSEs ... (add comma after "systems")

SuggestedRemedy

For PoDL systems, there are multiple types of PSEs ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.4.6.3** *P* **89** *L* **41** # i-70

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

100 +/-0.1 % (add space before "0.1", remove space before "%" to meet the style guide requirements)

SuggestedRemedy

100 +/- 0.1%

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.4.6.3** *P* **90** *L* **2** # i-71

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

3.18 kHz +/- 1 % ... 0.1 MHz +/- 1 % (remove 2 x space before %)

SuggestedRemedy

3.18 kHz +/- 1% ... 0.1 MHz +/- 1%

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.5.11** *P* **90** *L* **15** # i-72

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

For PoDL systems there are five types ... (add comma after "systems")

SuggestedRemedy

For PoDL systems, there are five types ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **104** *SC* **104.7** *P* **92** *L* **27** # i-18

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *EZ*

"Table 104-6" is an external cross-reference, so should be forest green.

SuggestedRemedy

Apply character tag "External" to "Table 104-6"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.7.1.4** *P* **97** *L* **22** # i-38

Yseboodt, Lennart Signify

Comment Type **ER** *Comment Status* **D** *PoDL*

104.7.1.4 is the subclause that specifies how a PoDL system can determine the actual cable resistance between the PIs.
The measured value is named "RCable_initial". This value is then increased with a margining factor and the result is called RAutoclass.

Autoclass is a specific term used in Clause 145 to denote a classification mechanism.
The parameter naming here is confusing, as this is about a cable resistance measurement method.

SuggestedRemedy

Rename RAutoclass to RCable.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace "RAutoclass" with "RCable" in sub-clause 104.7.4.1 and in Equation 104-5 (Page 97)

Cl **104** *SC* **104.7.1.4** *P* **97** *L* **26** # i-19

Anslow, Peter Ciena

Comment Type **ER** *Comment Status* **D** *EZ*

As pointed out in Comment #11 against D2.3:
In Equation (104-5) "min" is a function not a variable, so should not be italic font.
Same issue for Equation (104-6)

SuggestedRemedy

Change "min" to be in upright font in both Equation (104-5) and Equation (104-6)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **104** *SC* **104.7.1.5** *P* **97** *L* **49** # i-39

Yseboodt, Lennart Signify

Comment Type **E** *Comment Status* **D** *PoDL*

In the variable description of Eq 104-6, several variables are missing.

SuggestedRemedy

Add descriptions for:
- PClass(min)
- IPI(max)
- RAutoclass (which becomes RCable)
- PPD(max)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert the following definitions below Equation 104-5 (Page 97):

Rcable is the calculated link segment resistance
Pclass(min) is is the minimum average available output power at the PSE PI.
IPI(max) is is the maximum current flowing at the PSE and PD PIs except during inrush or an overload condition.
PPD(max) is the maximum average available power at the PD PI

and grant editorial license to conform to defintion style.

Cl **104** *SC* **104.7.2.6** *P* **100** *L* **40** # i-40

Yseboodt, Lennart Signify

Comment Type **TR** *Comment Status* **D** *PoDL*

Bits 13:8 in the VOLT_POWER_INFO register (Table 104-10) denote the power the PD is asking.
The table says "Power requested by PD, 0.3125 W per LSB".

With the 6 available bits, we can express power up to (2^6)-1 * 0.3125W = 19.69W.
This is less than the amount of power supported by PoDL.

SuggestedRemedy

Suggest to:
- use bits 15:8 and make the LSB count for 400mW, resulting in max 102W.

Make sure to align solution with similar comment on Table 104-11.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make the following changes:
1) In Table 104-10, first Row, first Column, change from "b[15:14]" to "b[31:20]" ; second Row, first Column, change from "b[13:8]" to "b[19:8]" ; second Row, third Column, change from "Power requested by PD, 0.3125 W per LSB" to "Power requested by PD, 0.025 W per LSB"
2) In 104.7.2.6, line 29 change from "shall respond with a 16-bit VOLT_POWER_INFO read payload" to "shall respond with a 32-bit VOLT_POWER_INFO read payload"
3) In 104.7.2.5, line 43, change from "contents of the preceding 16-bit Read/Write payload" to "contents
of the preceding Read/Write payload"
4) In 104.7.1.5 line 49, change from "is the PD Requested Power as reported in b[13:8] of VOLT_POWER_INFO" to "is the PD Requested Power as reported in b[19:8] of VOLT_POWER_INFO"
5) In 104.7.1.5 line 36, change from "via the PD Requested Power, PPD_req, field of the VOLT_POWER_INFO Register b[13:8]" to "via the PD Requested Power, PPD_req, field of the VOLT_POWER_INFO Register b[19:8]"

Cl **104** *SC* **104.7.2.7** *P* **101** *L* **16** # i-41

Yseboodt, Lennart Signify

Comment Type **TR** *Comment Status* **D** *PoDL*

Bits 5:0 in the POWER_ASSIGN register (Table 104-11) denote the power assigned to the PD.
Like in the other Table, 6 bits with 0.3125W/bit only get us to just under 20W

SuggestedRemedy

Implement solution consistent as with fix VOLT_POWER_INFO.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Make the following changes:
1) In Table 104-11, first Row, first Column, change from "b[15:6]" to "b[31:12]" ; second Row, first Column, change from "b[5:0]" to "b[11:0]" ; second Row, third Column, change from "PD assigned power, 0.3125 W per LSB" to "PD assigned power, 0.025 W per LSB"
2) In 104.7.2.7 line 5, change from "the PSE shall transmit a 16-bit POWER_ASSIGN write payload" to "the PSE
shall transmit a 32-bit POWER_ASSIGN write payload"
3) In 104.7.2.8 line 25, change from "the PD shall respond with a 16-bit POWER_ASSIGN read payload" to "the PD shall respond with a 32-bit POWER_ASSIGN read payload"
4) In 104.7.1.5 line 52, change from "is the PD Assigned Power by PSE as assigned in b[5:0] of POWER_ASSIGN" to "is the PD Assigned Power by PSE as assigned in b[11:0] of POWER_ASSIGN"
5) In 104.7.1.5 line 2 on page 98, change from "the PSE determines PPD_assign, as assigned in b[5:0] of POWER_ASSIGN" to "the PSE determines PPD_assign, as assigned in b[11:0] of POWER_ASSIGN"

Cl **146** *SC* **146** *P* **104** *L* **1** # i-174

Seaman, Michael MICK SEAMAN

Comment Type **E** *Comment Status* **D** *Editorial*

There appears to be no editing instruction to add the new cclause 146.

SuggestedRemedy

Add suitable editing instruction. At the bottom of the prior page would be convenient, so as not to disrupt og 104 layout or force pagination differences when an rolled up edition is produced.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add the following editing instruction at the top of page 104 (immediately prior to header for clause 146):
"Insert Clause 146 to Clause 148 in numeric order (see later in this amendment for the addition of corresponding annexes):"

Add the following editing instruction at the top of page 236 (immediately prior to header of Annex 146A):
"Insert Annex 146A through Annex 146B in alphanumeric order (see earlier in this amendment for the addition of corresponding clauses):"

Cl **146** *SC* **146.1** *P* **104** *L* **15** # i-296

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **T** *Comment Status* **D** *PMA Electrical*

As there are 2 link segment implementations (one for 2.4 Volt and one for 1 Volt) this sentence needs to be defined differently. As this occurs at a lot of places it is proposed to define everything to 2.4V 1000m link only

SuggestedRemedy

Add at line 16 after " this clause are met" For insertion loss take Equation 146-10.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Existing text references the normative requirements in this clause. The normative requirements for the link segment would be relative to the transmit output voltage modes that the PHY supports. When the (optional) 2.4 Vpp mode is supported and selected, that would be Equation 146-10, but when the (mandatory) 1.0 Vpp mode is supported, that would be 146-11.

This is clear in 146.7.1.1

Cl **146** *SC* **146.1** *P* **104** *L* **15** # i-232

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *MDI*

Clarify the demarcation points between the specified PHY and the cabling. I have seen and heard apparent confusion in the TF that makes me think some think the spec is a chip interface spec.

SuggestedRemedy

Change the text: "...between the attachment points (Medium Dependent Interface (MDI))," to: between the DTE attachment points (Medium Dependent Interface (MDI)),

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Identical language is used in other 802.3 clauses, e.g., clause 97, in usage consistent with clause 146.
Commenter's proposed text provides no clarifying benefit when the chip in question is an SOC considered a self-contained DTE.

Cl **146** *SC* **146.1.2** *P* **104** *L* **33** # i-338

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Suggest that '... effective rate of 10 Mb/s ..' should read '... an effective data rate of 10 Mb/s ..'.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "effective rate" to "effective data rate" at P104 L33

Cl **146** *SC* **146.1.2** *P* **104** *L* **37** # i-233

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *EZ*

It isn't clear here that you are talking about the coding on the link rather than the XMII.

SuggestedRemedy

Change the text: "...transmitted at 7.5 MBd." to: "transmitted at 7.5 Mbd on the link segment."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change the text: "...transmitted at 7.5 MBd." to: "transmitted at 7.5 MBd on the link segment."

Cl **146** *SC* **146.1.2** *P* **105** *L* **50** # i-73

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

... provides clock recovery, link management and PHY Control functions. (serial comma after "management" is missing)

SuggestedRemedy

... provides clock recovery, link management, and PHY Control functions.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.1.2.2** *P* **106** *L* **10** # i-74

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

... up to 1000 m in length. (avoid redundant wording)

SuggestedRemedy

... up to 1000 m.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.1.2.3** *P* **106** *L* **26** # i-75

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

While the transmit function is in the LPI mode the PHY may disable data path ... (use comma after "mode")

SuggestedRemedy

While the transmit function is in the LPI mode, the PHY may disable data path ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.1.2.4** *P* **106** *L* **40** # i-339

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Definitions*

Since Clause 146 uses the term 'code-group' the definition for code-group found in IEEE Std 802.3-2018 subclause 1.4.198 needs to be updated to include Clause 146 10BASE-T1L.

SuggestedRemedy

Suggest that:
[1] 'For 10BASE-T1L, a set of three ternary symbols that, when representing data, conveys four bits, as defined in 146.3.' be added to IEEE Std 802.3-2018 subclause 1.4.198.
[2] The text '... Clause 36, Clause 40, and Clause 96.)' in IEEE Std 802.3-2018 subclause 1.4.198 be changed to read '... Clause 36, Clause 40, Clause 96 and Clause 146).'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.1.2.4** *P* **106** *L* **43** # i-340

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Definitions*

Since Clause 146 uses the term 'ternary' the definition for ternary found in IEEE Std 802.3-2018 subclause 1.4.471 needs to be updated to include Clause 146 10BASE-T1L.

SuggestedRemedy

Suggest that the definition be updated to read 'In 10BASE-T1L, 100BASE-T4, and 100BASE-T1, a ternary data element. A ternary symbol can have one of three values: -1, 0, or +1. (See IEEE Std 802.3, Clause 23, Clause 96, and Clause 146).'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.1.3.1** *P* **107** *L* **9** # i-76

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If the logical expression associated with the IF evaluates TRUE all the actions listed between THEN and ELSE will be executed. (add comma after "TRUE")

SuggestedRemedy

If the logical expression associated with the IF evaluates TRUE, all the actions listed between THEN and ELSE will be executed. (please change this also on page 168, line 41 and page 214, line 22)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.1.3.1** *P* **107** *L* **11** # i-77

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If the logical expression associated with the IF evaluates FALSE the actions listed between ELSE and END will be executed. (add a comma after "FALSE")

SuggestedRemedy

If the logical expression associated with the IF evaluates FALSE, the actions listed between ELSE and END will be executed. (please change this also on page 168, line 43 and page 214, line 24)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.2.5** *P* **110** *L* **52** # i-78

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

... defined in 146.3.3.2 to represent MII data, idle data or zero data. (serial comma after "idle data" is missing)

SuggestedRemedy

... defined in 146.3.3.2 to represent MII data, idle data, or zero data.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.2.10.3** *P* **113** *L* **37** # i-160

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *PMA*

"The receiver may adjust the link training and clock recovery" "Link training" is defined as a mode of operation and mentioning it here does not make sense.

SuggestedRemedy

Change to "The receiver may adjust the clock recovery."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** SC **146.3.3.1** P **117** L **18** # i-341

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *EZ*

Suggest that 'In each symbol period, PCS Transmit generates a ...' should be changed to read 'In each symbol period, the PCS Transmit function generates a ...'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** SC **146.3.3** P **117** L **18** # i-342

Law, David Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *State Diagram*

Is it correct that 'The PCS Transmit function shall conform to the PCS Transmit state diagram in Figure 146-5 ...' and that 'In each symbol period, PCS Transmit generates a symbol An provided to the PMA ...'? The PCS Transmit state diagram in Figure 146-5 changes state based on STD being true, with STD being an alias for symb_triplet_timer_done, and the output of the PCS Transmit state diagram is tx_symb_triplet which is defined in subclause 146.3.3.1.1 'Variables' as 'A triplet of ternary symbols generated by the PCS Transmit function after 4B3T encoding.'.

I think the problem is that there is another function within the PCS Transmit function that is missing from the PCS Transmit state diagram in Figure 146-5, the 'multiplexor' shown in Figure 146-6 'PCS transmit symbol generation'. This 'multiplexor' function operates at the symbol clock rate and serialises the tx_symb_triplet code-groups output by the PCS Transmit state diagram into individual symbols.

This may also explain when subclause 146.3.3.1.3 'Timers' defines the symb_timer that is not used in the PCS Transmit state diagram in Figure 146-5.

SuggestedRemedy

[1] Insert a new subclause 146.3.3.2 titled 'PCS Transmit multiplexor state diagram' that reads 'In each symbol period, the PCS Transmit multiplexor generates a ternary symbol that can take the values of {-1, 0, +1} and passes it to the PMA sublayer via the PMA_UNITDATA.request primitive. The nominal symbol clock frequency is specified in 146.5.4.5.'. Renumber the following subclauses as required.

[2] Add a new subclause 146.3.3.2.1 titled 'Variables' that reads:

pcs_reset
The pcs_reset parameter set by the PCS Reset function.
Values: TRUE or FALSE

tx_symb_vector
A ternary symbol generated through serialization of tx_symb_triplet. This symbol is conveyed to the PMA as the parameter of a PMA_UNITDATA.request(tx_symb_vector) service primitive.
Values: A ternary transmit symbol. The ternary symbols may take on one of the values {-1, 0, +1}.

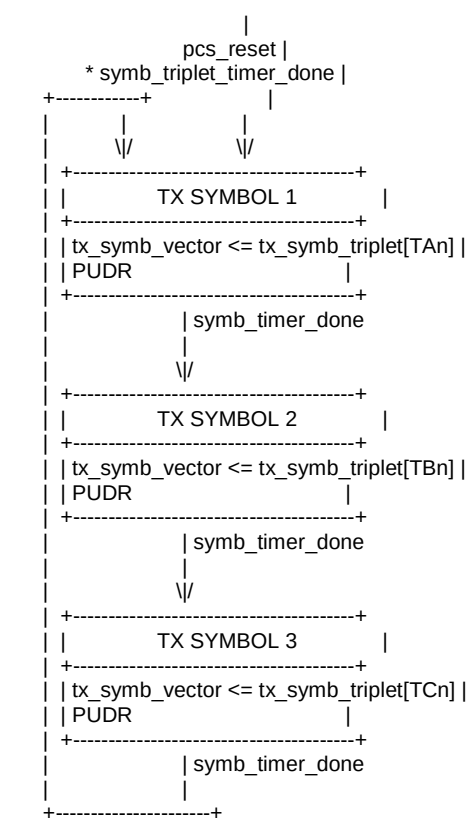
tx_symb_triplet{TAn, TBn, TCn)
A triplet of ternary symbols generated by the PCS Transmit state diagram. The element TAn is the first ternary symbol transmitted; TCn is the last ternary symbol transmitted.
Value: A triplet of ternary transmit symbols. Each of the ternary symbols may take on one of the values {-1, 0, +1}.

[4] Add a new subclause 146.3.3.2.2 titled 'Timers'. Move the symb_timer definition from subclause 146.3.3.1.3 Timers to this new subclause.

[5] Add a new subclause 146.3.3.2.4 'Abbreviations' that reads:

PUDR
Alias for PMA_UNITDATA.request(tx_symb_vector).

[6] Insert a new Figure 145-6 shown below (view using a non-proportional font such as courier), renumbering the following figures as required.



[7] Add text to subclause 146.3.3 'PCS Transmit' that reads 'The PCS Transmit function shall conform to the PCS Transmit state diagram in in Figure 146-5 and the PCS Transmit multiplexor state diagram in 146-6, and their associated state variables, functions, timers, and messages.'.

[8] Delete the first and second paragraphs of subclause 146.3.3.1 'PCS Transmit State Diagram' as these not functions of the PCS Transmit state diagram which is what this subclause is describing, change the text '... the PCS Transmit function passes ...' in the current third paragraph to read '... the PCS Transmit state diagram passes ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1** *P* **117** *L* **20** # i-79

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

The integer, n, is a time index, ... (remove commas around "n")

SuggestedRemedy

The integer n is a time index, ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1** *P* **117** *L* **20** # i-161

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *EZ*

"The integer, n, is a time index" should have no commas

SuggestedRemedy

Change to "The integer n is a time index."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accomodated by comment i-179
Response to comment i-179 is:
PROPOSED ACCEPT.
Change to "The integer n is a time index, ..."

Cl **146** *SC* **146.3.3.1** *P* **117** *L* **24** # i-343

Law, David — Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

Subclause 1.4.463 'Start-of-Stream Delimiter (SSD)' reads 'Within IEEE 802.3, a pattern of defined codewords used to delineate the boundary of a data transmission sequence on the Physical Layer stream.'.
In addition the PCS Transmit state diagram in Figure 146-5 changes state based on STD being true, with STD being an alias for symb_triplet_timer_done, and the output of the PCS Transmit state diagram is tx_symb_triplet which is defined in subclause 146.3.3.1.1 'Variables' as 'A triplet of ternary symbols generated by the PCS Transmit function after 4B3T encoding.'.

There is a similar issue with ESD (see IEEE Std 802.3-2018 subclause 1.4.242).

SuggestedRemedy

Suggest that:

[1] The text '... passes an SSD of 12 consecutive symbols ... replaces the first 16 bits of the preamble.' be changed to read '... passes an SSD of a sequence of 4 code-groups ... replaces the first 2 bytes of the preamble.'.

[2] The text '... a special code ESD ... of 12 consecutive symbols is ...' be changed to read '... a special code ESD ... of 3 code-groups is ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1** *P* **117** *L* **31** # i-80

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

Therefore, this symbol triplet will be used for the COMMA symbols ... (avoid redundant wording)

SuggestedRemedy

This symbol tripled is used for the COMMA symbols ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1** *P* **117** *L* **32** # i-344

Law, David — Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Suggest that '... symbol triplet (0, 0, 0) ...' should read '... symbol triplet {0, 0, 0} ...'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1** *P* **117** *L* **33** # i-162

Zimmerman, George — ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *EZ*

"Therefore, this symbol triplet will be used" is not standard language in the style manual

SuggestedRemedy

Change to "This symbol triplet is used"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accomodated by comment i-80.
Response to comment i-80 is:
PROPOSED ACCEPT.
(Change to)
"This symbol tripled is used for the COMMA symbols ..."

Cl **146** *SC* **146.3.3.1.1** *P* **118** *L* **26** # i-81

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Editorial*

loc_lpi_req is defined in 146.3.3.1.1 and also in 146.4.4.1, while the definition is 146.4.4.1 is the more appropriate. Should be aligned.

SuggestedRemedy

Change the description for loc_lpi_req in Clause 146.3.3.1.1 to "See 146.4.4.1" or copy text for loc_lpi_req from 146.4.4.1 to 146.3.3.1.1

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Copy text for loc_lpi_req from 146.4.4.1 to 146.3.3.1.1

Cl **146** *SC* **146.3.3.1.1** *P* **118** *L* **34** # i-345

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

Suggest that the transmit symbol order of tx_symb_triplet should be provided as part of the tx_symb_triplet variable definition.

SuggestedRemedy

[1] Change 'tx_symb_triplet' to read 'tx_symb_triplet(Tan, TBn, TCn)'.
[2] Add the text 'The element TAn is the first ternary symbol transmitted; TCn is the last ternary symbol transmitted.' to the variable description after the text '... 4B3T encoding.'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1.1** *P* **118** *L* **35** # i-346

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *PCS*

It is not clear to me on reading the draft if 4B3T encoding is only when Sdn[3:0] is being encoded in to ternary triplet as defined in Table 146-1 '4B3T encoding' or if it includes all the encoding defined in Figure 146-5 'PCS transmit state diagram' which also include ternary triplets such as COMMA and ESD4.

If it is the former, only the encoding defined in Table 146-1, the text 'A triplet of ternary symbols generated by the PCS Transmit function after 4B3T encoding.' in the tx_symb_triplet variable definition will need to be updated as tx_symb_triplet is also assigned values such as COMMA (see SSD COMMA1 VECTOR state) and ESD4 (see ESD VECTOR state).

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "'A triplet of ternary symbols generated by the PCS Transmit function after 4B3T encoding." in the tx_symb_triplet variable definition (146.3.3.1.1, P118 L35)" to
"A triplet of ternary symbols generated by the PCS Transmit function. These include 4B3T encoded data and assigned values (see 146.3.3.2.6)."

Cl **146** *SC* **146.3.3.1.1** *P* **118** *L* **36** # i-347

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Suggest that '... generated by the PCS Transmit function after ...' should read '... generated by the PCS transmit state diagram after ...'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1.1** *P* **118** *L* **40** # i-82

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

After PCS Reset the initial value ... (use comma after "Reset")

SuggestedRemedy

After PCS Reset, the initial value ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1.3** *P* **119** *L* **17** # i-348

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

In the 'Restart time' description for the symb_timer, suggest that the text '... expiration, timer restart resets the condition symb_timer_done.' be changed to read '... expiration; restarting the timer resets the condition symb_timer_done.'. Similarly, in the 'Restart time' description for the symb_triplet_timer, suggest that the text '... expiration, timer restart resets the condition symb_triplet_timer_done.' be changed to read '... expiration; restarting the timer resets the condition symb_triplet_timer_done.'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1.3** *P* **119** *L* **18** # i-349

Law, David — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *PMA*

As illustrated in Figure 146-2 '10BASE-T1L PHY interfaces' and 146-3 'PCS reference diagram', and defined in IEEE Std 802.3-2018 subclause 22.2.2.1, TX_CLK is sourced from the PHY to the RS, not the other way round. Despite this, I was unable to find a specification of TX_CLK in Clause 146. Suggest that TX_CLK is generated by symb_triplet_timer and that symb_triplet_timer be generated from symb_timer.

SuggestedRemedy

[1] Change the description of the symb_timer to read 'A continuous free-running timer. PMA_UNITDATA.request messages are is issued by the PCS concurrently with symb_timer_done.'.

[2] Change the description of the symb_triplet_timer to read 'A continuous free-running timer that shall expire synchronously with every third expiration of symb_timer. TX_CLK (see 22.2.2.1) shall be generated from symb_triplet_timer with the rising edge of TX_TCLK generated synchronously with symb_triplet_timer_done.'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
(commenter's proposed resolution + change to 146.4.5.4)
[1] Change the description of the symb_timer to read 'A continuous free-running timer. PMA_UNITDATA.request messages are is issued by the PCS concurrently with symb_timer_done.'.

[2] Change the description of the symb_triplet_timer to read 'A continuous free-running timer that shall expire synchronously with every third expiration of symb_timer. TX_CLK (see 22.2.2.1) shall be generated from symb_triplet_timer with the rising edge of TX_TCLK generated synchronously with symb_triplet_timer_done.'

[3] Change 146.4.5.4 (P139 L43) to add new first paragraph:
"The clock recovery provides a synchronous clock for sampling the signal on the pair. While it may not drive the MII directly, the Clock Recovery function is the underlying root source of RX_CLK."

Cl **146** *SC* **146.3.3.1.5** *P* **119** *L* **43** # i-350

Law, David — Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *State Diagram*

The constants DISPRESET3 is defined in subclause 146.3.3.1.5, the PCS transmit state diagram constants, but is not used in the PCS transmit state diagram. In addition Table 146-2 defines multiple values for DISPRESET3 dependant on the current disparity.

SuggestedRemedy

Suggest that the definition of the constant DISPRESET3 is deleted.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.1.5** *P* **120** *L* **1** # i-83

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The usage of the brackets in the conditional branches of Figure 146-5 is not consistent within the Figure itself and with other Clauses of 802.3cg.

SuggestedRemedy

Remove all "(" and ")" brackets within the conditional branches as they are not needed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Order of precedence of operators is not defined in IEEE Std 802.3, so brackets are used when there are multiple operations (see clause 145 IEEE Std 802.3bt-2019 which needed to define these).
Brackets provide clarity to the reader when evaluating combined actions.

Review of other diagrams in clause 146 suggests the following change needed:
P120 L10 (Figure 146-5) change left-hand exit from SEND IDLE to "STD * (!tx_enable_mii)
"
P128 L1 (Figure 146-8) change entry condition to WAIT_SCRAMBLER to add parens around the compound term of the "or":
"pcs_reset +
((!receiving) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected)])"

P130 L21 (Figure 146-10) change left-hand exit condition of RECEIVE state to add parens around !receiving:
"(!receiving) +
(link_status = FAIL)"

Editor to review other added clauses for consistency and revise accordingly to add brackets/parens where needed.

Cl **146** *SC* **146.3.3.1.5** *P* **120** *L* **7** # i-351

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *State Diagram*

In some cases, the result of a function is assigned to a variable, for example, the action in the ESD DISPRESET VECTOR state is tx_symb_triplet <= DISPRES(tx_disparity), yet in other cases, there is no assignment, for example, the action in the SEND IDLE state is ENCODE(Sdn[3:0], tx_disparity).

Suggest that there should be a consistent assignment of the result of a function to a variable within actions in state diagrams. Based on this:

[1] Change 'ENCODE(Sdn[3:0], tx_disparity)' to read 'tx_symb_triplet <= ENCODE(Sdn[3:0], tx_disparity)' in the SEND IDLE and TRANSMIT DATA in Figure 146-5 'PCS transmit state diagram'.

[2] Change 'DECODE (Rxn-5, rx_disparity)' to read 'RXD[3:0] <= DECODE (Rxn-5, rx_disparity)' in the DATA, FOURTH SSD, CHECK ESD COMMA2, CHECK ESD DISPRESET3, ESD, BAD ESD2, BAD ESD3, RX ERROR, CHECK ESD ESD4 and the BAD END states in Figure 146-8 'PCS receive state diagram (part a)' and Figure 146-9 'PCS receive state diagram (part b)'.

SuggestedRemedy

Suggest that there should be a consistent assignment of the result of a function to a variable within actions in state diagrams. Based on this:

[1] Change 'ENCODE(Sdn[3:0], tx_disparity)' to read 'tx_symb_triplet <= ENCODE(Sdn[3:0], tx_disparity)' in the SEND IDLE and TRANSMIT DATA in Figure 146-5 'PCS transmit state diagram'.

[2] Change 'DECODE (Rxn-5, rx_disparity)' to read 'RXD[3:0] <= DECODE (Rxn-5, rx_disparity)' in the DATA, FOURTH SSD, CHECK ESD COMMA2, CHECK ESD DISPRESET3, ESD, BAD ESD2, BAD ESD3, RX ERROR, CHECK ESD ESD4 and the BAD END states in Figure 146-8 'PCS receive state diagram (part a)' and Figure 146-9 'PCS receive state diagram (part b)'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
ENCODE and DECODE both update not only the triplet but the disparity. Commenter's suggested remedy is modified to reflect this.

[1] Change 'ENCODE(Sdn[3:0], tx_disparity)' to read '{ tx_symbol_triplet, tx_disparity } <= ENCODE(Sdn[3:0], tx_disparity)' in the SEND IDLE and TRANSMIT DATA in Figure 146-5 'PCS transmit state diagram'.

[2] Change 'DECODE (Rxn-5, rx_disparity)' to read '{ RXD[3:0], rx_disparity } <= DECODE (Rxn-5, rx_disparity)' in the DATA, FOURTH SSD, CHECK ESD COMMA2, CHECK ESD DISPRESET3, ESD, BAD ESD2, BAD ESD3, RX ERROR, CHECK ESD ESD4 and the BAD END states in Figure 146-8 'PCS receive state diagram (part a)' and Figure 146-9 'PCS receive state diagram (part b)'.

Cl **146** *SC* **146.3.3.1.5** *P* **120** *L* **8** # i-352

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *State Diagram*

The variable 'error' used in Figure 146-5 'PCS transmit state diagram' is not defined in subclause 146.3.3.1.1 'Variables'.

SuggestedRemedy

Add the following new variable to subclause 146.3.3.1.1 'Variables'.

error
PCS local variable that records if an errored transmission has occurs during data transmission.
Values: TRUE or FALSE

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.2** *P* **121** *L* **4** # i-353

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

The terms 'ternary triplet' with 20 instances, 'symbol triplet' with 11 instances 'code-group' with 10 instances and 'symbol group' with 3 instances seem to be used interchangeably throughout Clause 146 to mean a group of three ternary symbols

SuggestedRemedy

Suggest that one of these three terms is used through the Clause, and since code-group is the term defined in IEEE Std 802.3-2018 this would seem to be the prime candidate.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Replace instances of 'ternary triplet', 'symbol triplet' (including usage as tx_symbol_triplet) and 'symbol group' in clause 146 with 'code-group'.

Cl **146** *SC* **146.3.3.2.1** *P* **121** *L* **27** # i-354

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *PCS*

Subclause 146.3.3.2.1 'Side-stream scrambler polynomial', subclause 146.3.3.2.2 'Generation of Syn[3:0]' in combination of subclause 146.3.3.2.3 'Generation of scrambled bits Sdn[3:0]' define the requirements in respect to the generation of Sdn[3:0] which is input to the ENCODE() function in the SEND IDLE and TRANSMIT DATA states of Figure 146-5 'PCS transmit state diagram'.

Subclause 146.3.3.2.4 'Generation of ternary triplet in mode SEND_N and SEND_I', subclause 146.3.3.2.5 'Generation of ternary triplet in mode SEND_Z' and subclause 146.3.3.2.6 'Generation of symbol sequence' then describes the encoding that is actually performed by Figure 146-5 'PCS transmit state diagram'. Since subclause 146.1.3 'Conventions in this clause' states that ' Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails.' the state diagram requirements override the subclause 146.3.3.2.4 shall statements.

SuggestedRemedy

[1] Change the block '4B3T ENCODER' in Figure 146-6 'PCS transmit symbol generation' to read 'PCS transmit state diagram'.
[2] Add TX_CLK as an input to the 'PCS transmit state diagram' block as this is used as the tx_symb_triplet clock.
[3] Insert a new subclause 146.3.3.3 titled 'Generation of scrambled bits Sdn[3:0]' that reads 'The scrambled bits Sdn[3:0] used by the ENCODE function defined in 146.3.3.1.2 are generated as follows.
[4] Renumber subclause 146.3.3.2.1 to 146.3.3.3.1, subclause 146.3.3.2.2 to 146.3.3.3.2 and subclause 146.3.3.2.3 to 146.3.3.3.3.
[5] Insert a new subclause 146.3.3.4 titled 'Generation of ternary triplet' that reads 'The PCS transmit state diagram generates ternary triplets as follows.
[6] Renumber subclause 146.3.3.2.4 to 146.3.3.4.1, subclause 146.3.3.2.5 to 146.3.3.4.2 and subclause 146.3.3.2.6 to 146.3.3.4.
[7] Reword subclause 146.3.3.4.1, 146.3.3.4.2 and 146.3.3.4 to be descriptive rather than normative.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.2.1** *P* **121** *L* **30** # i-355

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Definitions*

Subclause 1.4.319 of IEEE Std 802.3-2018 reads 'master Physical Layer (PHY): Within IEEE 802.3, in a 100BASE-T2 or 1000BASE-T link containing a pair of PHYs, the PHY that uses an external clock for generating its clock signals to determine the timing of transmitter and receiver operations. It also uses the master transmit scrambler generator polynomial for side-stream scrambling. Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link. See also: slave Physical Layer (PHY).'.

This definition needs to be updated to add 10BASE-T1L, as well as several other PHYs that use master-slave timing, and to align to 10BASE-T1 and other PHYs that permit master-slave selection through management, hardware or Auto-Negotiation.

SuggestedRemedy

Suggest that the following changes be added to subclause 1.4 of IEEE P802.3cg:

[1] In subclause 1.4.319 of IEEE Std 802.3-2018, the text 'Within IEEE 802.3, in a 100BASE-T2 or 1000BASE-T link containing ...' be changed to read 'Within IEEE 802.3, in a 100BASE-T2, 1000BASE-T, 10GBASE-T, 25GBASE-T, 40GBASE-T, 10BASE-T1L, 100BASE-T1 or 1000BASE-T1 link containing ...'.

[2] In subclause 1.4.319 of IEEE Std 802.3-2018, the text 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link.' be changed to read 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link, or in the case of a PHY where Auto-Negotiation is optional and not used, Master and slave PHY status is determined by management or hardware configuration.'.

[3] In subclause 1.4.456 of IEEE Std 802.3-2108, the text 'Within IEEE 802.3, in a 100BASE-T2 or 1000BASE-T link containing ...' be changed to read 'Within IEEE 802.3, in a 100BASE-T2, 1000BASE-T, 10GBASE-T, 25GBASE-T, 40GBASE-T, 10BASE-T1L, 100BASE-T1 or 1000BASE-T1 link containing ...'.

[4] In subclause 1.4.456 of IEEE Std 802.3-2108, the text 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link.' be changed to read 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link, or in the case of a PHY where Auto-Negotiation is optional and not used, Master and slave PHY status is determined by management or hardware configuration.'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
[1] In subclause 1.4.319 of IEEE Std 802.3-2018, the text 'Within IEEE 802.3, in a 100BASE-T2 or 1000BASE-T link containing ...' be changed to read 'Within IEEE 802.3, in a 100BASE-T2, 1000BASE-T, 10BASE-T1L, 100BASE-T1, 1000BASE-T1, or any MultiGBASE-T link containing ...'.

[2] In subclause 1.4.319 of IEEE Std 802.3-2018, the text 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link.' be changed to read 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link, or in the case of a PHY where Auto-Negotiation is optional and not used, Master and slave PHY status is determined by management or hardware configuration.'.

[3] In subclause 1.4.456 of IEEE Std 802.3-2108, the text 'Within IEEE 802.3, in a 100BASE-T2 or 1000BASE-T link containing ...' be changed to read 'Within IEEE 802.3, in a 100BASE-T2, 1000BASE-T, 10BASE-T1L, 100BASE-T1, 1000BASE-T1, or any MultiGBASE-T link containing ...'.

[4] In subclause 1.4.456 of IEEE Std 802.3-2108, the text 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link.' be changed to read 'Master and slave PHY status is determined during the Auto-Negotiation process that takes place prior to establishing the transmission link, or in the case of a PHY where Auto-Negotiation is optional and not used, Master and slave PHY status is determined by management or hardware configuration.'.

Cl **146** *SC* **146.3.3.2.1** *P* **121** *L* **30** # i-84

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

For the master PHY PCS Transmit shall employ ... (use comma after "PHY")

SuggestedRemedy

For the master PHY, PCS Transmit shall employ ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.2.1** *P* **121** *L* **33** # i-85

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The two polynomials are defined as gm(x) and gs(x) with small characters for "s" and "m". This is different to the naming in 146.3.4.3. The naming should be unified.

SuggestedRemedy

Change to gM(x) and gS(x) with M and S in subscript.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The polynomials in 146.3.4.3 are different, there is no need to unify.

Cl **146** *SC* **146.3.3.2.1** *P* **121** *L* **35** # i-86

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

For the slave PHY PCS Transmit shall employ ... (use comma after "PHY")

SuggestedRemedy

For the slave PHY, PCS Transmit shall employ ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.2.6** *P* **123** *L* **8** # i-356

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

IEEE Std 802.3 subclause 1.4.471 'ternary symbol' states that 'A ternary symbol can have one of three values: -1, 0, or +1.' and in most cases, the IEEE P802.3cg follows this in relation to 10BASE-T1L code-groups which is a set of three ternary symbols. There are a few instances where just '-' is used instead of -1, and '+' or '1' is used to represent '+1'. As an example, Table 146-1 uses '-' and '+', yet Table 146-2 immediately below uses '-1' and '+1'.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accomodated by comment i-360.
Response to comment i-360 is:
PROPOSED ACCEPT IN PRINCIPLE.
add footnote to Table 146-1 that '-' is an abbreviation for the ternary symbol value '-1' and that '+' is an abbreviation for the ternary symbol value '+1', and (2) on page 11, line 7, change '{-1, 0, 1}' to read '{-1, 0, +1}'.

Cl **146** *SC* **146.3.3.2.4** *P* **123** *L* **35** # i-357

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Suggest that '... symbol triplet (0, 0, 0) ...' should read '... symbol triplet {0, 0, 0} ...'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.2.5** *P* **123** *L* **45** # i-358

Law, David — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *State Diagram*

There seems to be a disconnect between Figure 146-5 'PCS transmit state diagram' which outputs tx_symb_triplet, Figure 146-6 'PCS transmit symbol generation' that outputs tx_symb_triplet from a '4B3T ENCODER', and the text in subclause 146.3.3.2.5. While Figure 146-6 shows tx_mode as an input to the 4B3T ENCODER that produces tx_symb_triplet, and subclause 146.3.3.2.5 says that 'The ternary triplet (TAn, TBn, TCn) shall be a zero vector (0, 0, 0) when tx_mode = SEND_Z.' the states diagrams in 146-4 and 146-5 would seem to produce a different result.

If tx_mode = SEND_Z the Figure 146-4 'PCS data transmission enabling state diagram' will be in the 'DISABLE DATA TRANSMISSION' state, setting both tx_enable_mii and tx_error_mii to FALSE. In turn, if tx_enable_mii = FALSE the Figure 146-5 'PCS transmit state diagram' will, if necessary return to and, remain in the 'SEND IDLE' state. This will result in tx_symb_triplet being set to the result of ENCODE(Sdn[3:0], tx_disparity) and not (0, 0, 0) as required by subclause 146.3.3.2.5.

This appears to be a discrepancy between the state diagram and text requirements in respect to tx_symb_triplet, and since subclause 146.1.3 'Conventions in this clause' states that 'Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails.' tx_symb_triplet has to be set to ENCODE(Sdn[3:0], tx_disparity) and not (0, 0, 0). I don't believe that this is intended.

SuggestedRemedy

[1] Add the following definition to subclause 146.3.3.1.5 'Constants':

ZERO
A vector of three zero symbols sent when tx_mode = SEND_Z as specified in subclause 146.3.3.2.5.

[2] Replace the action ENCODE(Sdn[3:0], tx_disparity) in the SEND IDLE state of Figure 146-5 'PCS transmit state diagram' with:

```
IF(tx_mode = SEND_Z) THEN
  tx_symb_triplet <= ZERO
  tx_disparity <= 2
ELSE
   ENCODE(Sdn[3:0], tx_disparity)
END
```

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.3.2.6** *P* **123** *L* **51** # i-359

Law, David — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *EZ*

Subclause 146.3.3.2.6 'Generation of symbol sequence' states that 'A ternary triplet (TAn, TBn, TCn) shall be sent in the following order: TAn, TBn, TCn, TAn+1, TBn+1, TCn+1 ...'. The following Tables, 146-1 to 146-3, then define the various ternary triplet code-groups. Of these three tables only one, Table 146-3, defines which symbols are TAn, TBn, TCn.

SuggestedRemedy

To ensure the unambiguous definition of the transmission order, define which symbols are TAn, TBn, TCn in Table 146-1 and 146-2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add a note under Table 146-1:
"The Ternary Triplet is (TAn, TBn, TCn)."
Add "(TAn, TBn, TCn)" under "Disparity = 1", "Disparity = 2", and "Disparity = 3"

Cl **146** *SC* **146.3.3.2.6** *P* **124** *L* **8** # i-360

Law, David — Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

IEEE Std 802.3 subclause 1.4.471 'ternary symbol' states that 'A ternary symbol can have one of three values: -1, 0, or +1.' and in most cases the IEEE P802.3cg follows this in relation to 10BASE-T1L code-groups which is a set of three ternary symbols. There are a few instances where just '-' is used instead of -1, and '+' or '1' is used to represent '+1'. As an example, Table 146-1 uses '-' and '+', yet Table 146-2 immediately below uses '-1' and '+1'.

SuggestedRemedy

Suggest that: (1) in Table 146-1 that all instances of '-' are replaced with '-1', and all instances of '+' are replaced with '+1'. Alternatively add footnote that '-' is an abbreviation for the ternary symbol value '-1' and that '+' is an abbreviation for the ternary symbol value '+1', and (2) on page 11, line 7, change '{-1, 0, 1}' to read '{-1, 0, +1}'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
add footnote to Table 146-1 that '-' is an abbreviation for the ternary symbol value '-1' and that '+' is an abbreviation for the ternary symbol value '+1', and (2) on page 11, line 7, change '{-1, 0, 1}' to read '{-1, 0, +1}'.

Cl **146** *SC* **146.3.3.2** *P* **124** *L* **43** # i-284

McCarthy, Mick — Analog Devices Inc.

Comment Type **T** *Comment Status* **D** *PCS*

The delimiters SSD4 and ESD4/ESD_ERR4, as defined in Table 146-3, are always the same. If a PHY is transmitting a stream of packets of constant length and with a fixed interpacket gap, there will therefore be a non-zero value in the auto-correlation sequence of the transmitted signal. This will produce a harmonic in the transmit power spectrum. This could be avoided by randomizing the sign of the delimiters.

SuggestedRemedy

Add scheme to randomize the sign of the delimiters.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
TFTD.
Commenter's proposed remedy is unclear, as is the magnitude of the issue.

Cl **146** *SC* **146.3.4.1.1** *P* **126** *L* **23** # i-87

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

After PCS Reset the initial value ... (use comma after "Reset")

SuggestedRemedy

After PCS Reset, the initial value ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.1** *P* **126** *L* **32** # i-361

Law, David — Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

The values for the variable disparity_error are not defined.

SuggestedRemedy

Suggest that 'Values: TRUE or FALSE' be added to the variable disparity_error definition.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.1** *P* **126** *L* **32** # i-88

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *EZ*

The values for disparity_error are missing.

SuggestedRemedy

Add a new line with: Values: TRUE or FALSE

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.2** *P* **126** *L* **40** # i-362

Law, David — Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

The values for the function valid_idle are not defined.

SuggestedRemedy

Suggest that 'Values: TRUE or FALSE' be added to the valid_idle function.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.2** *P* **126** *L* **41** # i-89

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

This function checks whether or not the decoded data bits ... (redundant wording)

SuggestedRemedy

This function checks if the decoded data bits ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Delete "or not" on page 146 line 42
Insert new line after end of sentence:
Values: TRUE or FALSE

Cl **146** *SC* **146.3.4.1.2** *P* **127** *L* **1** # i-90

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

It returns a Boolean value indicating whether or not one of the four ... (redundant wording)

SuggestedRemedy

It returns a Boolean value indicating if one of the four ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Delete "or not" on page 147 line 1
Insert new line after end of sentence:
Values: TRUE or FALSE

Cl **146** *SC* **146.3.4.1.2** *P* **127** *L* **16** # i-91

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *EZ*

For function CHECK_DISP it is not clear, which table to use for the 4B3T encoding.

SuggestedRemedy

Add a sentence at the end of the paragraph: The encoding rules for the 4B3T encoding are stated in Table 146-1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.2** *P* **127** *L* **20** # i-92

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Editorial*

disparity_error is meant as function result, but it may be misinterpreted as the variable disparity error, defined in 146.3.4.1.1.

SuggestedRemedy

Change the text for CHECK_DISP to: The CHECK_DISP function checks, if the currently received triple ternary symbol is allowed for the current rx_disparity, and returns a TRUE or FALSE according to the relation:
RXn != table4B3T(inverse_table4B3T(Rxn), rx_disparity)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **127** *L* **25** # i-93

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *State Diagram*

Period and behavior for timer RSTCD are not defined the timer behind RSTCD is not defined.

SuggestedRemedy

Define a new timer: rcv_symb_triplet_timer - The rcv_symb_triplet_timer shall be generated synchronously with the PCS receive clock RX_CLK. Continuous timer: The condition rcv_symb_triplet_timer_done becomes true upon timer expiration. Restart time: Immediately after expiration, timer restart resets the condition rcv_symb_triplet_timer_done. Duration: Three symbol times (see 146.5.4.5) Modify existing text for RSTCD as: Abbreviation for Receive Symbol Triplet Conversion Done, which is equivalent to the timer condition rcv_symb_triplet_timer_done.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **127** *L* **25** # i-163

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **T** *Comment Status* **D** *State Diagram*

The definition of RSTCD is unclear. From the phrase "Receive Symbol Tripled Conversion Done". This appears to be a symbol timer for triplets of received symbols, similar to symb_triplet_timer in 146.3.3.1.3. The text only says it is synchronized with the PCS receive clock. Also, this timer is not explicitly started anywhere.

SuggestedRemedy

Change RSTCD to Received_symbol_triplet_conversion_timer. Insert after sentence ending "RX_CLK." (new line, after line 25) "Continuous timer: The condition Received_symbol_triplet_conversion_timer_done (RSTCD) becomes true upon timer expiration.
Restart time: Immediately after expiration, timer restart resets the condition Received_symbol_triplet_conversion_timer_done (RSTCD).
Duration: Three symbol times (see 146.5.4.5)" Also, add new subclause 146.3.4.1.4 Abbreviations, with text: "RSTCD Received_symbol_conversion_timer_done."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **1** # i-94

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **X** *Editorial*

The usage of the brackets in the conditional branches of Figure 146-8 is not consistent within the Figure itself and with other Clauses of 802.3cg.

SuggestedRemedy

Remove all "(" and ")" brackets within the conditional branches as they are not needed.
Convert the remaining "[" and "]" brackets to "(" and ")" brackets afterwards.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accomodated by comment i-83.
Response to Comment i-83 is:
Order of precedence of operators is not defined in IEEE Std 802.3, so brackets are used when there are multiple operations (see clause 145 IEEE Std 802.3bt-2019 which needed to define these).
Brackets provide clarity to the reader when evaluating combined actions.

Review of other diagrams in clause 146 suggests the following change needed:
P120 L10 (Figure 146-5) change left-hand exit from SEND IDLE to "STD * (!tx_enable_mii)
"
P128 L1 (Figure 146-8) change entry condition to WAIT_SCRAMBLER to add parens around the compound term of the "or":
"pcs_reset +
((!receiving) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected)])"

P130 L21 (Figure 146-10) change left-hand exit condition of RECEIVE state to add parens around !receiving:
"(!receiving) +
(link_status = FAIL)"

Editor to review other added clauses for consistency and revise accordingly to add brackets/parens where needed.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **4** # i-164

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **T** *Comment Status* **D** *Editorial*

Figure 146-8 has two open ended branches with conditions including rcv_jab_detected, but this variable is not defined, and appears like it should be rcv_overrun_detected.

SuggestedRemedy

Change rcv_jab_detected to rcv_overrun_detected in Figure 146-8 (2 instances, lines 4 & 5)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **4** # i-363

Law, David Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *Editorial*

The variable 'rcv_jab_detected' used in the open arrow entry to the WAIT SCRAMBLER and LINK FAILED states in Figure 146-8 'PCS receive state diagram (part a)' is not defined in subclause 146.3.4.1.1 'Variables'. On review of the draft, while I can find information about the transmit jabber, it is not clear to me where rcv_jab_detected woudlbe sourced from, or when it would be asserted.

SuggestedRemedy

Add a definition for the rcv_jab_detected variable to subclause 146.3.4.1.1 'Variables', or remove rcv_jab_detected from the open arrow entry to the WAIT SCRAMBLER and LINK FAILED states.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accomodated by comment i-164.
Response to comment i-164 is:
PROPOSED ACCEPT.
Change rcv_jab_detected to rcv_overrun_detected in Figure 146-8 (2 instances, lines 4 & 5)

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **5** # i-364

Law, David Hewlett Packard Enterprise

Comment Type **ER** *Comment Status* **D** *Editorial*

Subclause 146.1.3.1 'State diagram notation' states that 'The conventions of 21.5 are adopted with the extension that some states in the state diagrams use an IF-THEN-ELSE-END construct to condition which actions are taken within the state.'. Table 21-1 'State diagram operators' in IEEE Std 802.3-2018 subclause 21.5.4 'Operators' lists the characters '( )' as 'Indicates precedence'. Based on this the use of '[ ]' in state diagram transitions should be replaced with '( )'.

SuggestedRemedy

Replace the three instances of '[ ]' used to indicate precedence in Figure 146-8 state diagram transitions with '( )'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **5** # i-95

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Editorial*

The two initial conditions for the state diagram contain the old variable name "rcv_jab_detected". The new variable name is "rcv_overrun_detected".

SuggestedRemedy

Change the two occurrances of "rcv_jab_detected" in state diagram Figure 146-8 to "rcv_overrun_detected".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accomodated by comment i-164.
Response to comment i-164 is:
PROPOSED ACCEPT.
Change rcv_jab_detected to rcv_overrun_detected in Figure 146-8 (2 instances, lines 4 & 5)

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **9** # i-96

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *State Diagram*

Variable rx_lpi_active is not initialized within WAIT SCRAMBLER state of the PCS receive state diagram. This variable is provided to the PHY Control state machine and also to the PMA receive block. While for the PHY Control state machine, the minwait_timer prevents misinterpreting this variable, not having this variable initialized may have, depending on the implementation, side effects in the PMA receive block, as this block accidently may assume, that the PHY is currently in LOW POWER IDLE state and handle the signal receiving accordingly (e.g. setting the receiver accidently into low power state).

SuggestedRemedy

Add "rx_lpi_active <= FALSE" at the end of the execution block of state WAIT SCRAMBLER.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **25** # i-365

Law, David Hewlett Packard Enterprise

Comment Type **ER** *Comment Status* **D** *Editorial*

Subclause 146.1.3.1 'State diagram notation' states that 'The conventions of 21.5 are adopted with the extension that some states in the state diagrams use an IF-THEN-ELSE-END construct to condition which actions are taken within the state.'. Table 21-1 'State diagram operators' in IEEE Std 802.3-2018 subclause 21.5.4 'Operators' lists the 'Not Equal To' character <http://unicode.org/cldr/utility/character.jsp?a=2260> as 'Not equals'. I assume this is what is meant by the use '!=' in Figure 146-8, based on this the use of '!=! in state diagram transitions should be replaced with the 'Not Equal To' character.

SuggestedRemedy

Replace the eight instances of '!=' used in Figure 146-8 state diagram transitions with the 'Not Equal To' character <http://unicode.org/cldr/utility/character.jsp?a=2260>.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **25** # i-97

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The arcs from the exit conditions of states IDLE, CHECK SSD COMMA2, CHECK SSD DISPRESET3 and CHECK SSD SSD4 are fed to a common arc entering BAD DELIMITER state. According to the style guidelines separate arcs need to be used.

SuggestedRemedy

Draw separate arcs between states IDLE and BAD DELIMITER, CHECK SSD COMMA2 and BAD DELIMITER, CHECK SSD DISPRESET3 and BAD DELIMITER, and CHECK SSD SSD4 and BAD DELIMITER.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **41** # i-98

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *State Diagram*

Within the PCS receive state diagram the BAD DELIMITER state is called by a wrong SSD and also by a wrong ESD. Within BAD DELIMITER state a false carrier indication is sent over the MII. According to other Clauses within 802.3 a false carrier indication is only sent over the MII, if a wrong SSD, but not if a wrong ESD is detected.

SuggestedRemedy

Rename the BAD DELIMITER state to BAD SSD. Remove the "B" input arc from BAD SSD state. Add a new state BAD ESD right from the BAD SSD state and add the "B" input arc to this new BAD ESD state. Connect the output of the BAD ESD state to the IDLE state with branch condition "check_idle". Content of the BAD ESD state is: "RX_ER <= TRUE, RX_DV <= FALSE, RXD[3:0] <= 0000, receiving <= TRUE"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **128** *L* **45** # i-318

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type **T** *Comment Status* **D** *State Diagram*

tag [INDEX]
The function CHECK_DISP(RXn-5, rx_disparity) should be checking RXn-4, not RXn-5.
If it checks RXn-5, it is checking the value of RXn in the SSD state, which, according to the entry arc is SSD4.
The same offset error occurs multiple times also in the DECODE function.

SuggestedRemedy

In Figure 146-8, in all states, replace all occurrences of "RXn-5" to "RXn-4".
In Figure 146-9, in all states, replace all occurrences of "RXn-5" to "RXn-4".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.1.3** *P* **129** *L* **1** # i-99

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The usage of the brackets in the conditional branches of Figure 146-9 is not consistent with other Clauses of 802.3cg.

SuggestedRemedy

Remove all "(" and ")" brackets within the conditional branches as they are not needed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accommodated by comment i-83.
Response to Comment i-83 is:
Order of precedence of operators is not defined in IEEE Std 802.3, so brackets are used when there are multiple operations (see clause 145 IEEE Std 802.3bt-2019 which needed to define these).
Brackets provide clarity to the reader when evaluating combined actions.

Review of other diagrams in clause 146 suggests the following change needed:
P120 L10 (Figure 146-5) change left-hand exit from SEND IDLE to "STD * (!tx_enable_mii)
"

P128 L1 (Figure 146-8) change entry condition to WAIT_SCRAMBLER to add parens around the compound term of the "or":
"pcs_reset +
((!receiving) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected)])"

P130 L21 (Figure 146-10) change left-hand exit condition of RECEIVE state to add parens around !receiving:
"(!receiving) +
(link_status = FAIL)"

Editor to review other added clauses for consistency and revise accordingly to add brackets/parens where needed.

Cl **146** *SC* **146.3.4.1.3** *P* **130** *L* **1** # i-100

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The usage of the brackets in the conditional branches of Figure 146-10 is not consistent within the Figure itself and with other Clauses of 802.3cg.

SuggestedRemedy

Remove all "(" and ")" brackets within the conditional branches as they are not needed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accommodated by comment i-83.
Response to Comment i-83 is:
Order of precedence of operators is not defined in IEEE Std 802.3, so brackets are used when there are multiple operations (see clause 145 IEEE Std 802.3bt-2019 which needed to define these).
Brackets provide clarity to the reader when evaluating combined actions.

Review of other diagrams in clause 146 suggests the following change needed:
P120 L10 (Figure 146-5) change left-hand exit from SEND IDLE to "STD * (!tx_enable_mii)
"

P128 L1 (Figure 146-8) change entry condition to WAIT_SCRAMBLER to add parens around the compound term of the "or":
"pcs_reset +
((!receiving) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected)])"

P130 L21 (Figure 146-10) change left-hand exit condition of RECEIVE state to add parens around !receiving:
"(!receiving) +
(link_status = FAIL)"

Editor to review other added clauses for consistency and revise accordingly to add brackets/parens where needed.

Cl **146** *SC* **146.3.4.2** *P* **130** *L* **34** # i-366

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Suggest that '... (the triplet (0, 0, 0) ...' should read '... (the triplet {0, 0, 0} ...'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.4.2** *P* **130** *L* **35** # i-178

Hoglund, David Johnson Controls Inc

Comment Type **E** *Comment Status* **D** *Editorial*

The commas are of unequal strength in the note "(the triplet (0, 0, 0) will never occur, if this triplet is being received, then the symbol synchronization in the de-interleaving block needs to be adjusted)". Changing the first comma may help.

SuggestedRemedy

Change "(the triplet (0, 0, 0) will never occur, if this triplet is being received, then the symbol synchronization in the de-interleaving block needs to be adjusted)" to "(the triplet (0, 0, 0) will never occur: if this triplet is being received, then the symbol synchronization in the de-interleaving block needs to be adjusted)".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "(the triplet (0, 0, 0) will never occur, if this triplet is being received, then the symbol synchronization in the de-interleaving block needs to be adjusted)"

to (note deleted parenthesis)

"The code-group {0, 0, 0} should never occur. The symbol synchronization in the de-interleaving block needs to be adjusted if the code-group {0, 0, 0} is being received."

Cl **146** *SC* **146.3.4.3** *P* **131** *L* **3** # i-28

O Cuanachain, Oisin

Comment Type **E** *Comment Status* **D** *PCS*

The current wording here implies that the descrambling occurs before the decoding. This directly contradicts the definition of the DECODE function in Clause 146.3.4.1.2 where obviously the decoding occurs first followed by the descrambling.

SuggestedRemedy

Replace the existing text 'The PHY shall descramble the data stream and return the proper sequence of code-groups to the decoding
process for generation of RXD<3:0> to the MII.' with 'The PHY decodes the code-groups and returns the proper bit stream to the descrambling process for generation of RXD<3:0> to the MII'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.5** *P* **131** *L* **38** # i-101

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

encompass (needs to be singular)

SuggestedRemedy

encompasses

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.4.3** *P* **133** *L* **35** # i-102

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

..., it is highly recommended that PMA Receive include the functions of ... (needs to be singular)

SuggestedRemedy

..., it is highly recommended that PMA Receive includes the functions of ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.4.3** *P* **133** *L* **35** # i-409

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PMA*

"The sequence of symbols assigned to tx_symb_vector is needed to perform echo cancellation." is not sufficient. It should also include reference to the MASTER and SLAVE PMA clock recovery function.

SuggestedRemedy

Change the text to read
"In addition to the PMA Clock Recovery function (see 146.4.6), the sequence of symbols assigned to tx_symb_vector is needed to perform echo cancellation."

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The commenter asks for a tutorial and the standard is not a tutorial - no change required.

Commenter is incorrect.
The only information which is inherently needed is the transmitted symbol stream. The echo can be removed an any implementation-dependent manner. The standard is not intended to be a tutorial on signal processing or constrain possible solutions. For example, a receiver could estimate the timing separately from the data, or cancel in the continuous time domain.
Additionally, 146.4.6 states it is only for the SLAVE to recover the clock. MASTER does not have a clock recovery function.

Cl **146** *SC* **146.4.4** *P* **134** *L* **25** # i-103

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The first paragraph of Clause 146.4.4 seems to be redundant to 146.6.2 (and in part also 146.6.3).

SuggestedRemedy

Remove first paragraph of Clause 146.4.4. Likely also the second paragraph of Clause 146.6.2 can be removed as it seems to be redundant to the information in 146.6.3.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The same information (that there is both a forced mode for configuration and Auto-negotiation) is used in multiple sections because it is relevant to different contexts. In 146.4.4 it is relevant to the description of how the PHY control state diagram functions. 146.6.2 and 146.6.3 describe how master-slave configuration actually operates, and how that interacts with management registers.

Cl **146** *SC* **146.4.4** *P* **134** *L* **25** # i-165

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **T** *Comment Status* **D** *State Diagram*

The term "FORCE mode" is not defined anywhere in this clause, nor in the base standard. The setting of MASTER and SLAVE roles is not a mode, it is a function. In clause 96 there is a similar specification in 96.4.4, and the text there can be re-used. Note that this information is repeated in 146.6.2 and in 146.6.3 so it may not be necessary here at all.

SuggestedRemedy

Replace the first paragraph of 146.4.4 with the following (taken from 96.4.4) "If the Auto-Negotiation process (Clause 98) is not implemented or not enabled, PMA_CONFIG MASTER-SLAVE configuration is predetermined to be MASTER or SLAVE via management control during initialization or via default hardware setup."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.3.2.1** *P* **135** *L* **22** # i-155

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *Editorial*

rem_rcvr_status is defined as OK or NOT_OK where the primitive is defined 146.2.7.1 and in the state diagram (Figures 146-14 and 146-15). Here it is defined as TRUE or FALSE.

SuggestedRemedy

Change TRUE to OK and change FALSE to NOT_OK

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.4.4.2** *P* **136** *L* **14** # i-104

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *State Diagram*

The timer shall expire 100 ms after being started. (it has been missed to transfer the tolerance of the timer of +/- 1 ms from the original presentation to the draft).

SuggestedRemedy

The timer shall expire 100 ms +/- 1 ms after being started.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.4.4.2** *P* **136** *L* **17** # i-105

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *EEE*

Modify the LPI timers for 10BASE-T1L to support a wider range of implementations and better synchronization by using precise timers, synchronous with the symbol transmit rate.

SuggestedRemedy

Change the expiration times in the following way: lpi_sleep_timer (line 20): "The timer shall expire 250 us (625 triple ternary symbols) after being started.", lpi_quiet_timer (line 23): "The timer shall expire 6000 us (15 000 triple ternary symbols) after being started.", lpi_refresh_timer (line 27): "The timer shall expire 250 us (625 triple ternary symbols) after being started.", lpi_wake_timer (line 30): "The timer shall expire 250 us (625 triple ternary symbols) after being started."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change the expiration times in the following way: lpi_sleep_timer (line 20): "The timer shall expire 250 us after being started.", lpi_quiet_timer (line 23): "The timer shall expire 6000 us after being started.", lpi_refresh_timer (line 27): "The timer shall expire 250 us after being started.", lpi_wake_timer (line 30): "The timer shall expire 250 us after being started."

Cl **146** *SC* **146.4.4** *P* **137** *L* **1** # i-285

McCarthy, Mick Analog Devices Inc.

Comment Type **T** *Comment Status* **D** *EEE*

10BASE-T1L LPI signalling is driven primarily by MII data traffic.
No attempt has been made to introduce a scheme that synchronizes LPI quiet/refresh cycling between MASTER and SLAVE PHYs.
There is little predictability to LPI quiet/refresh cycling because of this, making implementation more complex.

SuggestedRemedy

Add LPI quiet/refresh cycling, synchronized using loc_lpi_req signalling during link startup.
A PHY implementation could use this scheme to know when link partner will be sending an LPI refresh state.
See attached document.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Only 1000BASE-T1 has synchronization for LPI quiet-refresh, whereas the other BASE-T PHYs with a similar quiet-refresh cycle (10GBASE-T and the other MultiGBASE-T PHYs) do not. Adding synchronization of quiet/refresh cycling would be the addition of a new, non-essential feature to 802.3cg without quantified benefit.

Cl **146** *SC* **146.4.4.3** *P* **137** *L* **1** # i-106

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The usage of the brackets in the conditional branches of Figure 146-14 is not consistent within the Figure itself and with other Clauses of 802.3cg

SuggestedRemedy

Remove all "(" and ")" brackets within the conditional branches as they are not needed.
Convert the remaining "[" and "]" brackets to "(" and ")" brackets afterwards, if there is only one level of brackets; keep the "[" and "]" on the outer brackets, if there are encapsulated brackets.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Accommodated by comment i-83.
Response to Comment i-83 is:
Order of precedence of operators is not defined in IEEE Std 802.3, so brackets are used when there are multiple operations (see clause 145 IEEE Std 802.3bt-2019 which needed to define these).
Brackets provide clarity to the reader when evaluating combined actions.

Review of other diagrams in clause 146 suggests the following change needed:
P120 L10 (Figure 146-5) change left-hand exit from SEND IDLE to "STD * (!tx_enable_mii)
"
P128 L1 (Figure 146-8) change entry condition to WAIT_SCRAMBLER to add parens around the compound term of the "or":
"pcs_reset +
((!receiving) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected)])"

P130 L21 (Figure 146-10) change left-hand exit condition of RECEIVE state to add parens around !receiving:
"(!receiving) +
(link_status = FAIL)"

Editor to review other added clauses for consistency and revise accordingly to add brackets/parens where needed.

Cl **146** *SC* **146.4.4.3** *P* **137** *L* **3** # i-176

Lewis, Jon
Dell EMC

Comment Type **E** *Comment Status* **D** *EZ*

Arrows and Lines in Figure 146-14 (part a and b) are not connsistent.

SuggestedRemedy

Change the figure to align the thickness of the lines and the size of the arrows.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.4.4.2** *P* **137** *L* **17** # i-107

Graber, Steffen
Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *EEE*

Initializing of variable "loc_lpi_req" in TRAINING state is missing. This is necessary because loc_lpi_req is used in the PCS scrambler definition, which can change the SEND_I encoding used in SEND IDLE, thus this variable needs to be initialized before starting to transmit idle data.

SuggestedRemedy

Add "loc_lpi_req <= FALSE" to TRAINING state.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.4.4.2** *P* **137** *L* **19** # i-108

Graber, Steffen
Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

According to the style guide the arcs from state exit conditions need to go directly to the destination state and should not be connected to another arc.

SuggestedRemedy

Connect the exit condition "silent_timer_done" of state SILENT directly to the input side of state SLAVE SILENT and not to the line of the exit condition of state SEND IDLE.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.4.4.3** *P* **138** *L* **1** # i-109

Graber, Steffen
Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The usage of the brackets in the conditional branches of Figure 146-15 is not consistent with other Clauses of 802.3cg.

SuggestedRemedy

Remove all "(" and ")" brackets within the conditional branches as they are not needed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accommodated by comment i-83.
Response to Comment i-83 is:
Order of precedence of operators is not defined in IEEE Std 802.3, so brackets are used when there are multiple operations (see clause 145 IEEE Std 802.3bt-2019 which needed to define these).
Brackets provide clarity to the reader when evaluating combined actions.

Review of other diagrams in clause 146 suggests the following change needed:
P120 L10 (Figure 146-5) change left-hand exit from SEND IDLE to "STD * (!tx_enable_mii)
"

P128 L1 (Figure 146-8) change entry condition to WAIT_SCRAMBLER to add parens around the compound term of the "or":
"pcs_reset +
((!receiving) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected)])"

P130 L21 (Figure 146-10) change left-hand exit condition of RECEIVE state to add parens around !receiving:
"(!receiving) +
(link_status = FAIL)"

Editor to review other added clauses for consistency and revise accordingly to add brackets/parens where needed.

Cl **146** *SC* **146.4.5.2** *P* **139** *L* **21** # i-110

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

The usage of the brackets in the conditional branches of Figure 146-16 is not consistent within the Figure itself and with other Clauses of 802.3cg.

SuggestedRemedy

Remove all "(" and ")" brackets within the conditional branches as they are not needed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Accommodated by comment i-83.
Response to Comment i-83 is:
Order of precedence of operators is not defined in IEEE Std 802.3, so brackets are used when there are multiple operations (see clause 145 IEEE Std 802.3bt-2019 which needed to define these).
Brackets provide clarity to the reader when evaluating combined actions.

Review of other diagrams in clause 146 suggests the following change needed:
P120 L10 (Figure 146-5) change left-hand exit from SEND IDLE to "STD * (!tx_enable_mii)
"

P128 L1 (Figure 146-8) change entry condition to WAIT_SCRAMBLER to add parens around the compound term of the "or":
"pcs_reset +
((!receiving) *
[(loc_rcvr_status = NOT_OK) +
(link_status = FAIL) +
(rcv_jab_detected)])"

P130 L21 (Figure 146-10) change left-hand exit condition of RECEIVE state to add parens around !receiving:
"(!receiving) +
(link_status = FAIL)"

Editor to review other added clauses for consistency and revise accordingly to add brackets/parens where needed.

Cl **146** *SC* **146.5.3** *P* **141** *L* **25** # i-179

Hoglund, David Johnson Controls Inc

Comment Type **E** *Comment Status* **D** *Editorial*

Suggest stronger punctuation such as a semicolon for clarity.

SuggestedRemedy

Change "For a MASTER PHY this is the output of the (divided) clock oscillator, for the SLAVE PHY this is the recovered clock." to "For a MASTER PHY this is the output of the (divided) clock oscillator; for the SLAVE PHY this is the recovered clock."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.5.4.1** *P* **141** *L* **49** # i-166

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *AutoNeg*

The information about existence of two transmitter output voltage modes and the rules for selection between them using auto-negotiation appears here for the first time. This information is somewhat out of
place in the transmitter electircal specification subclause. Note that the resolution rules are repeated in 146.6.4, but that subclause is about the management interface and should not discuss AN at all. The appropriate place for AN rules is in clause 98 where similar rules for master/slave configuration are described.

SuggestedRemedy

Add text about the two voltage modes in 146.1.2 where similar features like MASTER/SLAVE modes and AN are described, as a new 4th paragraph (P104 L43, after the paragraph on PAM3 mapping) "The 10BASE-T1L PHY may optionally support an increased transmit and receive capability, supporting 2.4 Vpp. See 146.5.4.1. Insert new subclause 98B.3.1 10BASE-T1L-specific bit assignments with text: "Configuration for 10BASE-T1L specific bits A23, A24, and A25 are specified in 146.6. Move the management interface information (2nd para (not note) of 146.5.4.1, P142 L4-7) to 146.6.4 (P146 L15) as a new first paragraph.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.5.5.1** *P* **144** *L* **15** # i-167

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **T** *Comment Status* **D** *PMA Electrical*

The BER is not purely an electrical specification. Bits are only available after PCS processing and any required performance can only be achieved after training is complete. There is no way to verify this requirement as written as the PCS doesn't have bit level error testing. Clause 113 has more complete text which may be used here.

SuggestedRemedy

Insert at the end of P144 L17, continuing the sentence ending in 10^-7: "after PCS processing and sent to the MII after completion of link training."
This specification can be verified by a frame error ratio less than 1.0x10^-6 for 800 octet frames.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.5.5.3** *P* **144** *L* **28** # i-168

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **T** *Comment Status* **D** *PMA Electrical*

"The BER is expected to be less than 10^-9, and, to satisfy this specification, the frame loss..." an expectation is not a specification.

SuggestedRemedy

Change to "The BER shall be less than 10^-9. This specification is satisfied when the frame loss..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change to "The BER shall be less than 10^-9. This specification is satisfied when the frame loss..."
Change PICS PMAE22 (Page 164 L43) to:
"BER < 10^-9 with an alien crosstalk noise of magnitude of -106 dBm/Hz
abd bandwidth of 10 MHz at the MDI."

Cl **146** *SC* **146.5.5.3** *P* **144** *L* **28** # i-297

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **T** *Comment Status* **D** *PMA Electrical*

There are 2 link equations either use one or define for both.

SuggestedRemedy

Insert after 146.7 with Il from equation 146-10

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The existing reference to 146.7 is clear. When the link is using the optional 2.4 Vpp mode, the insertion loss limit of a link compliant to 146.7 is equation 146-10, when the transmitters are in 1.0 Vpp mode, the limit is equation 146-11.

Cl **146** *SC* **146.5.5.3** *P* **144** *L* **48** # i-180

Hoglund, David Johnson Controls Inc

Comment Type **E** *Comment Status* **D** *EZ*

Replace "may be adopted" with "may be adapted" if the intent is to permit change to the resistor values. (There is no such note for figure 147-19.)

SuggestedRemedy

Replace "may be adopted" with "may be adapted".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.5.6** *P* **145** *L* **3** # i-234

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PMA Electrical*

The word "unterminated" here implies that loopback only works if there is no compliant link segment and other MAU connected but there is a requirement of some sort for some circuit characteristics at the MDI to guarantee the echo.

SuggestedRemedy

Clarify and specify

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "unterminated" to "open"
(this is what is shown in the figure)

Cl **146** *SC* **146.6.3** *P* **146** *L* **1** # i-235

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *AutoNeg*

It would seem that this text and the text in the referenced claused don't actually have a resolution process.

SuggestedRemedy

Add a reference to 32.5.1 which tells what action to take when the process fails.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add new first sentence to first paragraph of 146.6.1 Support for Auto-Negotiation (P145 L40):
"If Auto-Negotiation is supported and enabled the mechanism described in Clause 98 shall be used."

(Clause 98 specifies the requested MASTER/SLAVE resolution for BASE-T1 PHYs when not in a forced configuration)

Cl **146** *SC* **146.6.4** *P* **146** *L* **15** # i-236

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *AutoNeg*

Is this guaranteed to work on a max length link which normally requires 2.4v to communicate? Please clarify.

SuggestedRemedy

If so please clarify. If not, please clarify how to operate with or without auto-negotation on a max length segment.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The commenter asks for a tutorial and the standard is not a tutorial - no change required.

The PHY clause is an inappropriate place to discuss the detection characteristics of the auto-negotiation signal and such a discussion is not necessary for interoperability.

The autonegotiation signal used is 625 kbps DME (2 level) whereas the 10BASE-T1L signal is 7.5 MBd PAM-3, more than making up for the 8 dB difference between the 1Vpp and 2.5Vpp transmit power levels.

Cl **146** *SC* **146.7** *P* **146** *L* **40** # i-237

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Link Segment*

The term "link segment" used in this clause is insufficiently precise. Since this text is effectively overriding the definition in 1.4 it needs to be complete.

SuggestedRemedy

Change the sentence to read: The term "link segment" used in this clause refers to the MDI to MDI connection of a single balanced pair of conductors operating in full duplex.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The language parallels usage in 25, 32, 40, 55, 97, 113, and 126.

Cl **146** *SC* **146.7** *P* **146** *L* **40** # i-238

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Link Segment*

The text "A link segment is specified based on process control application requirements..." would seem to be directed at all link segments where it should be properly directed specifically at the link segment discussed above.

SuggestedRemedy

Change the text to read: "The link segment specified in this clause is based on process control application requirements..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.1** *P* **147** *L* **28** # i-20

Anslow, Peter Ciena

Comment Type **ER** *Comment Status* **D** *EZ*

This editor's note just describes work going on in another standards body. This is not appropriate in a draft that is suitable for submission to RevCom

SuggestedRemedy

Delete the editor's note.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.1.1** *P* **147** *L* **37** # i-169

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *Link Segment*

"For PHYs in the 2.4 Vpp operation mode, the insertion loss of each 10BASE-T1L link segment shall meet..." The link segment is not a part of the PHY and does not know in what operation mode the PHY is. Similarly in P148 L26.

SuggestedRemedy

There should be two specifications for link segments, a high--loss link segment that is only supported when the link (both PHYs) is in 2.4 Vpp mode and a low-loss segment that is supported regardless of the mode.

Divide existing 146.7.1.1 into 2 subclauses: 146.7.1.1.1 Insertion loss for PHYs in the 2.4 Vpp operation mode (starts at P147 L36) and 146.7.1.1.2 Insertion loss supported for PHYs in 1.0 Vpp operation mode (starts at P148 L25, with "For PHYs in the 1.0..."). Add text to 146.7.1 "There are two link segment insertion loss specifications supported, depending on whether the 2.4 Vpp mode is supported abd selected, as specified in 146.6.4. All 10BASE-T1L PHYs support the insertion loss specified in 146.7.1.2, but support of the insertion loss specified in 146.7.1.1 is only required when the 2.4 Vpp transmit/receive ability is operational."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Fix typo "abd" in commenters suggested remedy:

Divide existing 146.7.1.1 into 2 subclauses:
146.7.1.1.1 Insertion loss for PHYs in the 2.4 Vpp operation mode (starts at P147 L36) and 146.7.1.1.2 Insertion loss supported for PHYs in 1.0 Vpp operation mode (starts at P148 L25, with "For PHYs in the 1.0...").

Add text to 146.7.1 "There are two link segment insertion loss specifications supported, depending on whether the 2.4 Vpp mode is supported and selected, as specified in 146.6.4. All 10BASE-T1L PHYs support the insertion loss specified in 146.7.1.2, but support of the insertion loss specified in 146.7.1.1 is only required when the 2.4 Vpp transmit/receive ability is operational.

Cl **146** *SC* **146.7.1.1** *P* **148** *L* **26** # i-298

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **T** *Comment Status* **D** *Link Segment*

How does the cabling knows that the PHY is in the 1 Volt Mode? Especially because it is not set automatically fort shorter links!

SuggestedRemedy

Tod avoid this issue it is proposed that the PHY switches to the 1 Volt Mode automatically if the Link has an IL less than 15 dB at 3.75 MHz

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Resolve with comment#169

Cl **146** *SC* **146.7.1.2** *P* **149** *L* **27** # i-299

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *Link Segment*

Return loss limits were changed often. The latest values were from a measured cable. Due to the high insertion loss the reach is much less then 1000m violating the 1000m objective. But there is an installed base and it should be a better route to capture this.

SuggestedRemedy

As the majority of the cables have an impedance around 100 ohm as a compromise return loss should be 15 dB from 1 MHz to 20 MHz and below 9+9f. To capture the special cable with high insertin loss there would be 2 exceptions. Long links could go down to 13 dB. The critical 10m should be avoided in short runs.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Resolve with comment#111

Cl **146** *SC* **146.7.1.2** *P* **149** *L* **36** # i-111

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Link Segment*

The current return loss specification does not support cables with a tolerance of 80 to 120 ohms under worst-case conditions (short cables).

SuggestedRemedy

Change the value 13.5 dB to 13 dB within Equation 146-13. Change the frequency dependency of the RL below 0.5 MHz from 9 + 9 x f to 9 + 8 x f.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.1.3** *P* **150** *L* **30** # i-367

Law, David — Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *EZ*

The abbreviation 'NVP is used subclause 146.7.1.3 'Maximum link delay' without definition in Clause 146, nor anywhere else in IEEE P802.3cg. I would imagine it is meant to be 'Nominal Velocity of Propagation', however I note that NVP is used in this subclause in reference to Equation (80-1) which uses the parameter n to represents the ratio of the speed of electromagnetic propagation in the cable to the speed of light in a vacuum, not NVP.

SuggestedRemedy

Change '... using Equation (80-1) with an NVP of 0.6.' to read '... using Equation (80-1) with an n of 0.6.' with 'n' italicised.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.1.4** *P* **150** *L* **39** # i-301

Schicketanz, Dieter — University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *Link Segment*

As conducted immunity is the same for E1 and E2 TCL should be the same fort E1 and E2 too.

SuggestedRemedy

in table 146-5 change from .1 to 10 MHz to >50 and from 10 to 20 MHz to 50-20log(f/10) for E1 and E2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Resolve with comment#112

Cl **146** *SC* **146.7.1.4** *P* **150** *L* **39** # i-302

Schicketanz, Dieter — University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *Link Segment*

No specific limit could be elaborated for ELTCTL

SuggestedRemedy

Delete this requirement in table 146-5

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Resolve with comment#112

Cl **146** *SC* **146.7.1.4** *P* **150** *L* **44** # i-112

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Link Segment*

Table 146-5 provides different TCL and ELTCTL values for E1 and E2. As the conducted immunity test has the same test levels for E1 and E2 the TCL values should also be the same. As the conducted immunity test levels are significantly higher than the disturbance by alien disturbers, there is no need to distinguish between 1.0 Vpp and 2.4 Vpp operating mode.

SuggestedRemedy

Remove table 146-5 and replace this table by a table with the following entries for the TCL values: first row: of 0.1 MHz <= f <= 10 MHz: for E1: >= 50 dB; for E2: >= 50 dB, second row: 10 MHz < f <= 20 MHz: for E1: >= 50 - 20 log10(f / 10) dB; for E2: >= 50 - 20 log10(f / 10) dB. Remove the specification of the ELTCTL values.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.1.5** *P* **151** *L* **8** # i-300

Schicketanz, Dieter — University of Applied Science Reutlingen

Comment Type **TR** *Comment Status* **D** *Link Segment*

As conducted immunity is the same fort E1 and E2 the coupling attenuation should be the same fort E1 and E2 too.

SuggestedRemedy

Change the E1 value in Table 146-6 from 40 to 50

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Resolve with comment#113

Cl **146** *SC* **146.7.1.5** *P* **151** *L* **13** # i-113

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Link Segment*

The coupling attenuation for E1 is 10 dB lower than the coupling attenuation specified for E2. For both E1 and E2 during conducted immunity testing the same test levels are used. Therefore E1 should also have the same coupling attenuation value as E2.

SuggestedRemedy

Change the coupling attenuation value for E1 from >= 40 dB to >= 50 dB.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

E2 should be 50 dB based on 10 dB difference from E3 and E1 should be same as same as E2 as same test level used.
Change the coupling attenuation value for E1 from >= 40 dB to >= 50 dB.

For committee discussion

Cl **146** *SC* **146.7.2** *P* **151** *L* **33** # i-114

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Link Segment*

To ensure the total alien NEXT loss and alien FEXT loss coupled between 10BASE-T1L link segments is limited, multiple disturber alien near-end crosstalk (MDANEXT) loss and multiple disturber alien FEXT (MDAFEXT) loss is specified. (use relative pronoun after "ensure", use plural before "limited", use far-end cosstalk instead of FEXT (to be similar to near-end crosstalk just before), and use plural before "specified")

SuggestedRemedy

To ensure that the total alien NEXT loss and alien FEXT loss coupled between 10BASE-T1L link segments are limited, multiple disturber alien near-end crosstalk (MDANEXT) loss and multiple disturber alien far-end crosstalk (MDAFEXT) loss are specified.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.2.1** *P* **151** *L* **37** # i-171

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *Link Segment*

There are two subclauses for NEXT, one referring to MDANEXT and another to PSANEXT, but only one subclause for FEXT which includes both. In practice, PSANEXT/PSAFEXT are specified, and MDANEXT and MDAFEXT are definitions used.

SuggestedRemedy

Merge 146.7.2.2 into 146.7.2.1. with the title used in 146.7.2.2. Change the title of 146.7.2.3 (now 146.7.2.2) from "Multiple disturber alien far-end crosstalk (MDAFEXT) loss" to "Multiple disturber power sum alien far-end crosstalk (PSAFEXT) loss"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Merge 146.7.2.2 into 146.7.2.1.{Multiple disturber alien near-end crosstalk (MDANEXT) loss} with the title used in 146.7.2.2. {Multiple disturber power sum alien near-end crosstalk (PSANEXT) loss} Change the title of 146.7.2.3 (now 146.7.2.2) from "Multiple disturber alien far-end crosstalk (MDAFEXT) loss" to "Multiple disturber power sum alien far-end crosstalk (PSAFEXT) loss"

Cl **146** *SC* **146.7.2.1** *P* **151** *L* **41** # i-115

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

To ensure the total alien NEXT ... (use relative pronoun after "ensure")

SuggestedRemedy

To ensure that the total alien NEXT ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.2.2** *P* **152** *L* **7** # i-170

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *Editorial*

Equation 146-13 is a definition and should be an equality, not an inequality. Similarly in Equation 146-15.

SuggestedRemedy

Replace the inequality in equations 146-13 and 146-15 with "=".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE. Resolved with comment#116

Cl **146** *SC* **146.7.2.2** *P* **152** *L* **7** # i-116

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Editorial*

With Equation 146-13 the PSANEXT is calculated, it is not a limit, so it should be a "=" instead of a ">=". The same is valid for Equation 146-15 on the same page.

SuggestedRemedy

Change ">=" to "=" in Equation 146-13. Do the same for Equation 146-15 on the same page.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.2.3** *P* **152** *L* **28** # i-117

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

To ensure the total alien FEXT ... (use relative pronoun after "ensure")

SuggestedRemedy

To ensure that the total alien FEXT ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.2.3** *P* **152** *L* **29** # i-118

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

... coupled into a 10BASE-T1L link segment, multiple ... ("is limited" is missing after "segment")

SuggestedRemedy

... coupled into a 10BASE-T1L link segment is limited, multiple ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.7.2.3** *P* **152** *L* **46** # i-175

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

f / 20 in Equation 146-16 is not written in fraction style.

SuggestedRemedy

Use for f / 20 writing in fraction style, as it is done in Equation 146-14 on the same page.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.8** *P* **153** *L* **1** # i-239

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Big Ticket Item MDI*

Since the MDI connector that is called out is not required there is no standardized way or specifically characterized test point where specification or conformance testing can be done on a multi-vendor repeatable basis.

SuggestedRemedy

Add text that permits alternate connections/connectors can be used in the application environment, that the compliance requirements (like other Ethernet PHYs) are specified and tested at the mating surface of the specified MDI connector.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
IEEE Std 802.3 specifies compliant Ethernet ports at the MDI, but routinely does not specify the connectors used on test equipment or in test fixtures, and these may vary from vendor to vendor, test house to test house.

The specifications are made on the PHY port, which includes whatever MDI connector is used on the equipment under test. Permitting an alternate connector for testing, to unify the test equipment, would enable a situation where the device under test would no longer constitute a complete Ethernet port as intended for use, and therefore potentially invalidate the test results for the Ethernet port as intended for the application.

Cl **146** *SC* **146.8** *P* **153** *L* **1** # i-410

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *Big Ticket Item MDI*

The connectors described MAYBE used at the interface to the medium. This is an allowance. MDI is a normative conformance test point. The title of this subclause say "148.8 MDI specifications". It's not.

SuggestedRemedy

Change the title to "MDI Considerations" or "Medium Interface Connectors" or something else that avoids wrong inference that any of these connectors are normative interoperability test points.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter is incorrect.
The subclause, in its subordinate subclauses, spells out specifications for the MDI.

The second sentence of 146.8 states this - "It also specifies electrical requirements, including fault tolerance, at the MDI."

While connectors that may be used (and references to their specifications) are called out in 146.8.1, electrical, power, and fault tolerance specifications for the MDI are provided in subordinate subclauses 146.8.2, 146.8.3, 146.8.4, and 146.8.5.

Cl **146** *SC* **146.8.1** *P* **153** *L* **12** # i-196

Maguire, Valerie The Siemon Company

Comment Type **TR** *Comment Status* **D** *Big Ticket Item MDI*

The P802.3cg example text is no longer aligned with the TIA and ISO/IEC single-pair interface recommendations. Specifically, TIA and ISO/IEC recommended different connectors for different MICE environments. The results of the TIA and ISO/IEC evaluation would likely have been different (perhaps, even limited to one connector style) if it was agreed that operation across MICE1 to MICE3 was desired. As a result, there is no longer a basis for selecting these two connectors as the examples.

P802.3cg is close to publication and some of the example products are not commercially available.

SuggestedRemedy

On page 153, line 12: Replace, "Specific systems or applications can use connectors or terminals, in addition to those listed below, that support the link segment specification defined in 146.7." with, "Specific systems or applications can use connectors or terminals that support the link segment specification defined in 146.7.

Delete lines 15-54, including Figure 146-26 and Figure 146-27, on page 153.

Delete Figure 146-28, Figure 146-29, Figure 146-30, and Figure 146-31 on page 154.

Delete Table 146-8 on page 155.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
The TIA and ISO/IEC recommendations specify connectors used to connect sections of cable in the link segment (i.e., between the two MDIs). The may make different choices than the IEEE 802.3cg draft makes for the connector at the MDI.

The IEEE 802.3cg should liase the latest draft to TIA TR42 and ISO/IEC SC25 WG3 specifically pointing out the connector language so that those groups may choose whether to amend their specifications or respond (e.g., via liaison) otherwise.

Cl **146** *SC* **146.8.1** *P* **153** *L* **15** # i-46

Tillmanns, Ralf

Comment Type **T** *Comment Status* **D** *Big Ticket Item MDI*

The sentence 'Connectors meeting the requirements of IEC 63171-1 or IEC 61076-3-125 may be used as the mechanical interface to the balanced cabling.' gives the impression that the mechanical interfaces given are the ones that have to be used. The sentence above, however, indicates that others may be used as well. Therefore the intention of this comment is to clarify that, if other mechanical interfaces are used, they still have to meet requirements in accordance with IEC 63171.

SuggestedRemedy

Change the sentence 'Connectors meeting the requirements of IEC 63171-1 or IEC 61076-3-125 may be used as the mechanical interface to the balanced cabling.' to 'Connectors meeting the requirements of IEC 63171-1 or IEC 61076-3-125 and other connector types suitable for 1-pair applications meeting the requirements of IEC 63171 may be used as the mechanical interface to the balanced cabling.'

Proposed Response *Response Status* **W**

PROPOSED REJECT.
According to IEEE Standards style, 'may' can be replaced by 'is/are allowed'. The text "may be used" would therefore be understood as "are allowed to be used", which does not convey that these "have to be used" as the commenter suggests.
Further, the additional text that the conntectors meet IEC 63171 would would levy new requirements on the MDI connector without justification.

Cl **146** *SC* **146.8.4** *P* **155** *L* **33** # i-240

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *MDI*

The phrasing of this clause and the next one make it appear that this is a requirement for testing the wiring rather than as a test access point for testing the DTE. Further, the test limit for a withstand voltage has absolutely zero margin with respect to PoDL which is contrary to usual practice for withstand voltage requirements. Additionally, consideration should be given to the possibility of there being other voltages in a sheath shared with this instance of 10BASE-T1L such as PoE.

SuggestedRemedy

Change the text to make it clearer that this test is a test of the DTE as tested from the MDI. Raise the test limit to be more appropriate with traditional withstand limits (ref e.g. cl. 14, 10BASE-T) and real world requirements such as static discharge.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Commenter is incorrect in suggesting this requirement be raised to align with static discharge. It is a tolerance to a continuous DC power voltage, not a transient, limited-energy static discharge. That test has zero margin with respect to Clause 104 (PoDL), which has a maximum current of 1.360 A. Note that in low voltage systems such as these, current margin is the relevant parameter, not voltage.

The remainder of the comment (aligning with the wire pair) is Accomodated by i-42.

Response to comment i-42 is:
Change the quoted text in 146.8.4 to read:
"The device shall withstand without damage the application of any voltages between 0 V dc and 60 V dc with the source current limited to 2000 mA, applied across BI_DA+ and BI_DA-, in either polarity, under all operating conditions, for an indefinite period of time."

Cl **146** *SC* **146.8.4** *P* **155** *L* **34** # i-42

Yseboodt, Lennart Signify

Comment Type **TR** *Comment Status* **D** *Powering*

146.8.4:
"The wire pair of the MDI shall withstand without damage the application of positive voltages of up to 60 V dc with the source current limited to 2000 mA, under all operating conditions, for an indefinite period of time."

146.8.5:
"The wire pair of the MDI shall withstand without damage the application of short circuits of any wire to the other wire of the same pair or ground potential, as per Table 146-9, under all operating conditions, for an indefinite period of time."

- Why does 146.8.4 only cover positive voltages ?
- ... and 146.8.5 covers both polarities ?
- why is the subject of the sentence 'the wire pair of the MDI' when it should be the device itself ?

SuggestedRemedy

Change the quoted text in 146.8.4 to read:
"The device shall withstand without damage the application of any voltages between 0 V dc and 60 V dc with the source current limited to 2000 mA, applied across BI_DA+ and BI_DA-, in either polarity, under all operating conditions, for an indefinite period of time."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.8.5** *P* **155** *L* **43** # i-124

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

..., for an indefinite period of time. (redundant wording)

SuggestedRemedy

..., for an indefinite time.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Wording is clear.

Cl **146** *SC* **146.9.1** *P* **156** *L* **28** # i-21

Anslow, Peter Ciena

Comment Type **ER** *Comment Status* **D** *Safety*

This editor's note is not appropriate in a draft that is suitable for submission to RevCom

SuggestedRemedy

Change the text as appropriate and delete the editor's note.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Delete the editor's note. No changes to the body text, the isolation or revision project is behind this one in the process and may revise clauses added by 802.3cg if and when needed.

Cl **146** *SC* **146.9.2** *P* **156** *L* **35** # i-181

Hoglund, David Johnson Controls Inc

Comment Type **E** *Comment Status* **D** *Editorial*

Replace "secure" with past particple "secured" for parallelism with respect to the sentance that follows. If the comment is accepted, it also applies to identical text on page 204 line 30 in 147.10.2.

SuggestedRemedy

Replace "secure" with "secured".

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The intended meaning is not "secured" (fixed to its location), but actually is "secure".

Cl **146** *SC* **146.9.2** *P* **156** *L* **37** # i-125

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

... to any applicable local, state or national standards ... (add missing serial comma after "state")

SuggestedRemedy

... to any applicable local, state, or national standards ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.11.4.2.2** *P* **164** *L* **31** # i-119

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

7.5 MBd +/- 50 ppm has the wrong font size and/or style.

SuggestedRemedy

Use correct font size and style.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "MBd ± 50 ppm" to font Times New Roman on P146 L31 and P146 L40

Cl **146** *SC* **146.11.4.2.2** *P* **164** *L* **40** # i-120

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

7.5 MBd +/- 50 ppm has the wrong font size and/or style.

SuggestedRemedy

Use correct font size and style.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accomodated by comment i-119
Response to comment i-119 is:
PROPOSED ACCEPT IN PRINCIPLE.
Change "MBd ± 50 ppm" to font Times New Roman on P146 L31 and P146 L40

Cl **146** *SC* **146.11.4.3** *P* **165** *L* **9** # i-241

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *AutoNeg*

The statement is about a 2 DTE end-to-end system. The PICS is for a single DTE. The text here addresses a pair.

SuggestedRemedy

The text and result need to be restated for an appropriate test and result for a single transceiver.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
The basic requirement (146.6.2) is a requirement on the user, and inappropriate.

Change "shall be configured" to "should be configured" in two places on P145 L46.

Delete PICS item MI2.

Cl **146** *SC* **146.11.4.3** *P* **165** *L* **17** # i-121

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

45.2.1.185 has the wrong font size and/or style.

SuggestedRemedy

Use correct font size and style.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.
Change cross reference to 45.2.1.185 to 9 pt Times New Roman.

Cl **146** *SC* **146.11.4.3** *P* **165** *L* **18** # i-122

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

... when MDIO implemented, ... ("is" is missing)

SuggestedRemedy

... when MDIO is implemented, ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.11.4.4** *P* **165** *L* **26** # i-126

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *PICS*

Clause 146.11.4.4 requires mandatory ticking of most of the items (besides LMF2) for a PHY. The link segment Clause provides requirements for the link segment (which are in principle not testable by the PHY) and not for the PHY itself. The PHY needs to be designed to work in conjunction with the (worst-case) link segment definition, but not meet the link segment definition by itself.

SuggestedRemedy

Please add for each support field also a N/A [ ] option (so that ticking this N/A field is allowed for a PHY), as e.g. done in IEEE802.3bp or make otherwise clear, that the PHY itself does not need to fulfil the link segment spec itself, but only need to work with a link segment meeting the link segment specification with the BER specified for the PHY.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add new row to table of Major Capabilities and Options (146.11.3) P159 L21:
Item: *INS
Feature: Installation / cabling
Subclause: 146.7
Value/Comment: Items marked with INS include installation practices and cabling specifications not applicable to a PHY manufacturer.
Status: O
Support: Yes [ ] No [ ]

Change Status of items in 146.11.4.4 (Link Segment Characteristics) to INS:M
(LMF2 becomes INS:O, RTDL:M)

Make similar changes to 147.12.3 and 147.12.4.6 and 147.12.4.7

Cl **146** *SC* **146.11.4.4** *P* **165** *L* **31** # i-123

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

Insertion loss (1 Vpp operating mode) (the mode is called 1.0 Vpp operating mode)

SuggestedRemedy

Insertion loss (1.0 Vpp operating mode)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.11.4.5** *P* **166** *L* **9** # i-127

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

Support MDI2 status field is empty and tick box for MDI2 is missing.

SuggestedRemedy

Please add "M" in the status field for MDI2 and "Yes [ ]" in the support field for MDI2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.1** *P* **167** *L* **12** # i-411

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *Modes*

Chater and scope of this PHY clause and CSD concern.

This clause has three separate PHYs that should not be considered as one PHY with two options.

1. Full-Duplex P2P PHY: Performs echo cancellation, full-duplex over one transmission line. This is an optional PHY in CL147.

2. Half-Duplex P2P PHY: Traditiionally used with multi-port CL9 repeaters, this allows exactly two node network (one link, two link partners) and only such network, because the Clause 9 repeater is not supported as per proposed text in CL9. This is not a network. Two and only two node connection is a dedicated link. This is only mandatory PHY operation in CL147.

3. Half-Duplex Shared Medium PHY: Does NOT perform echo cancellation, half-duplex over shared medium. This is an optional PHY in CL147.

And the text says #1 and #3 are NOT interoperable -- CL147.1 says "..there are two mutually exclusive optional operating modes...".

The only mandatory PHY (Half-Duplex P2P) is useless. Two other PHYs are optional, but they are not optional to each other (mutually exclusive), yet all three PHYs are referred to as type 10BASE-T1S.

This clause organization is grossly in error. Each distinct PHY should has its own type designation (possibly its own clause, but only for clarity), #2 Half-duplex P2P PHY should be deleted for the stated reason of not being useful as a 'network'.

SuggestedRemedy

Pick the one PHY that meets CSD and objectives as written, or split this clause into at least two (one for P2P and one for Shared medium) separate PHY clauses and re-state the respective CSD as appropirate.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
CRG disagrees with the commenter. The clause contains one PHY with three modes, with a common-denominator for interoperability.
CRG disagrees with the commenter on interest in the mandatory mode of operation (#2).
There are multiple methods of inter-linking P2P half-duplex segments, without the use of c9 repeaters using multiple topologies of choice, allowing larger networks (with more than 2 stations).
See also responses given to #i-392 and to #i-451.
Response to #i-392 is as follows:
>>>>
PROPOSED REJECT.
Commenter seems to make multiple incorrect interpretations of the text.
Mutual exclusivity is with regards to the duplexity ("boot/execution mode"), i.e. a single PHY cannot be in half-duplex and full-duplex mode at the same time.
All 3 modes do share PCS, as per the current draft.
Echo-cancelation is not part of the text.
A single PMA implemented as specified may be shared in all modes of operation.
There are multiple methods of inter-linking P2P half-duplex segments, without the use of CL9 repeaters using multiple topologies of choice, allowing larger networks (with more than 2 stations).
<<<<

Cl **147** *SC* **147.1** *P* **167** *L* **12** # i-30

Marris, Arthur Cadence Design Systems, Inc.

Comment Type **T** *Comment Status* **D** *Modes*

"several modes" is not very precise

SuggestedRemedy

Change the word "several" to "three different"

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The paragraph in question describes clearly and in details how many modes are supported and how these relate to each other (e.g. mutual exclusivity of the half- and full-duplex modes). Adding the literal 3 would not solve a real problem, but it would give space for making the false - assumption - that all 10BASE-T1S PHYs support all these 3 modes (see optionality)

Cl **147** *SC* **147.1** *P* **167** *L* **12** # i-391

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *Modes*

[CSD] CSD/Broad Market Potential is no longer assured in this project when the half-duplex point to point link segment PHY operation, traditionally associated with broad market with use of star-wired multi-port repeaters (e.g. 10BASE-T hubs/repeaters) is not supported.

An explicit statement of mandatory operation of this PHY:
"The 10BASE-T1S PHY is specified to be capable of operating at 10 Mb/s in several modes. All 10BASE-T1S PHYs can operate as a half-duplex PHY with a single link partner over a point-to-point link segment defined in 147.7..."

An explicit statement of non-support of repeaters:
Pg 30, CL9.1 proposed change states "This clause specifies a repeater for use with IEEE 802.3 10 Mb/s baseband networks, with the exceptions of
10BASE-T1L (Clause 146) and 10BASE-T1S (Clause 147)...."

Repeating the concern -- only PHY operation that is mandatory is point-to-point link without any allowance for repeaters (i.e. exactly two node network) operating in half-duplex, contention resolution network does NOT have broad market potential.

SuggestedRemedy

Delete market-potential irrelevant PHY that supports exactly two node network over a point-to-point link, and make one of the more market-potential-relevant PHYs from
"...additionally, there are two mutually exclusive optional operating modes: a
full-duplex point-to-point mode over the link segment defined in 147.7, and a half-duplex shared-medium
mode, referred to as multidrop mode,..."
and update the CSD/Broad Market Potential as appropriate.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Broad market potential" IEEE 802 CSDs are an internal 802 document not in the scope of standards association ballot.
Commenter's suggested response is unclear as to the change which would satisfy him (it appears unlikely that simply the text quoted would satisfy him), and requests changes (IEEE 802 CSD) which are out of scope of SA ballot.
Additionally, the CRG disagrees with the commenter.
IEEE 802 Criteria for Broad Market potential are based on:
Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:
a) Broad sets of applicability.
B) Multiple vendors and numerous users (per IEEE 802 LMSC Operations Manual).
The draft was developed by the IEEE P802.3cg Task Force with an average of between 70 and 80 individuals affiliated with more than 20 companies.
The affiliated companies included multiple vendors and numerous users, including component suppliers and systems integrators from process control, automation, automotive, and enterprise networking areas. Over the draft's development, this broad group of individuals agreed, by consensus, to not support repeaters in the draft and on the modes supported.
In the judgement of the CRG, the current draft meets the 802 broad market potential CSD.

Cl **147** SC **147.1** P **167** L **13** # i-392

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *Modes*

[CSD] CL147 title states a single PCS/PMA type 10BASE-T1S. But in reality, it has three PHYs. Two of the three PHYs not compatible and do not interoperate. This issue is explicitly stated with "mutually exclusive" operation, which equals not-compatible and not interoperate.

"All 10BASE-T1S PHYs can operate as a half-duplex PHY with a single link partner over a point-to-point link segment defined in 147.7, and, additionally, there are two mutually exclusive optional operating modes: a full-duplex point-to-point mode over the link segment defined in 147.7, and a half-duplex shared-medium mode, referred to as multidrop mode, capable of operating with multiple stations connected to a mixing segment, defined in 147.8."

Full-duplex P2P PHY implements echo cancelation. Half-duplex shared meidum does not. They do not interoperate with each other. These may share the similar or substantially same PCS, these do not share PMAs. They do not interoperate; PMAs are substantially different; they are differnet PHYs. These two PHYs should be, at least, designated as different type.

If the argument is made that these two PHYs must support P2P half-duplex (therefore interoperate), and in such case, they interoperate, then we should also be reminded that P2P half-duplex (with no provision for repeaters) allow for exactly two node network collision based network. Exactly two node, and only two node, connectivity does not network make.

SuggestedRemedy

Either structure CL147 to specify two different PHY types, P2P full-duplex PHY, and 'multi-drop' half-duplex PHY. They do not interoperate with each other, therefore they are not the same type of PHY.
Or split CL147 into a CL on common PCS, and two more CLs, one for each of the two separate PMA for respective PHYs.

With regards to the P2P half-duplex PHY, please delete it from this draft. The value and use of exactly two (and only two) node network is very limited to say the least.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter seems to make multiple incorrect interpretations of the text.
Mutual exclusivity is with regards to the duplexity ("boot/execution mode"), i.e. a single PHY cannot be in half-duplex and full-duplex mode at the same time.
All 3 modes do share PCS, as per the current draft.
Echo-cancelation is not part of the text.
A single PMA implemented as specified may be shared in all modes of operation.
There are multiple methods of inter-linking P2P half-duplex segments, without the use of CL9 repeaters using multiple topologies of choice, allowing larger networks (with more than 2 stations).

Cl **147** SC **147.1** P **167** L **17** # i-31

Marris, Arthur Cadence Design Systems, Inc.

Comment Type **T** *Comment Status* **D** *MDI*

The 10BASE-T1S PHY can operate over media other than cables.

SuggestedRemedy

Make the following a new paragraph and change to:
"The medium supporting the operation of the 10BASE-T1S PHY is defined in terms of performance requirements between the attachment points (Medium Dependent Interface (MDI)), allowing implementers to specify their own media to operate the 10BASE-T1S PHY as long as the normative requirements included in this clause are met."

That is replace the word "cabling" with "medium" and "media"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** SC **147.1** P **167** L **19** # i-304

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **T** *Comment Status* **D** *Link Segment*

How can an implementer specify own cabling with so many option fort T1S?

SuggestedRemedy

This general statement should be elaborated with examples or just mention the most important: 25m multidrop with the relevant equations.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter provides insufficient information to determine a specific remedy.
It is unclear what commenter is referring to by "so many options".
The purpose of this sentence is to clearly state that anyone implementing cabling should focus mainly to the normative requirements for the link segment or mixing segment, as appropriate (i.e. 147.7 or 147.8).

Cl **147** SC **147.1** P **167** L **22** # i-200

Griffiths, Scott Rockwell Automation

Comment Type **E** *Comment Status* **D** *EZ*

Clause 148 describes PLCA, not how it is optionally supported.

SuggestedRemedy

Change first sentence on line 22 to "10BASE-T1S PHYs optionally support PHY Level Collision Avoidance (PLCA), described in Clause 148."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.1** *P* **167** *L* **23** # i-242

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *EZ*

Grammer, this is a comparative sentence that doesn't actually have two things to compare.

SuggestedRemedy

Either actually do a comparison or get rid of the sentence.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Remove the following sentence
====
PLCA provides improved performance in terms of effective throughput and maximum transmission latency when operating in half-duplex mode over a mixing segment network.
====

Cl **147** *SC* **147.1.1** *P* **167** *L* **29** # i-243

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *EZ*

Title is incorrect wrt clause contents. What is claimed in the title and what is stated in the first sentence are two different things.

SuggestedRemedy

Change title to: Relationship of 10BASE-T1S to other portions of this standard

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "Relationship of 10BASE-T1S to other standards" to "Relationship of 10BASE-T1S to other clauses"

Cl **147** *SC* **147.1.1** *P* **167** *L* **35** # i-244

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Management*

Sentence order could be clearer.

SuggestedRemedy

Change to read: Management Entity is required using MDIO or other function. Optional MDIO is defined in 35 Clause 45.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change this:
====
Optional MDIO is defined in Clause 45. Management Entity is required using MDIO or other function.
====
to this:
====
Management Entity is required using MDIO or other function. Optional MDIO is defined in Clause 45.
====

Cl **147** *SC* **147.1.1** *P* **167** *L* **36** # i-201

Griffiths, Scott Rockwell Automation

Comment Type **E** *Comment Status* **D** *Management*

"Management Entity is required using MDIO or other function." is not gramatically correct.

SuggestedRemedy

Change to "A Management Entity is required using MDIO or other functionality."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.1.2** *P* **167** *L* **42** # i-368

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Suggest that '... effective rate of 10 Mb/s ..' should read '... an effective data rate of 10 Mb/s ..' here and on line 44 and 50.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.1.2** *P* **167** *L* **47** # i-245

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Editorial*

"Additionally..., additionally..." is clumsy grammar and unnecessary.

SuggestedRemedy

Change start of paragraph 2 to read: "The 10BASE-T1S PHY may also operate using half-duplex..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change this:
====
Additionally, 10BASE-T1S PHYs supporting the full-duplex point-to-point
====
to this:
====
10BASE-T1S PHYs supporting the option of full-duplex point-to-point
====

Cl **147** *SC* **147.1.2** *P* **167** *L* **50** # i-246

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *Modes*

Text allows unlimited # of PHYs on a mixing segment. I believe this is not true or that it only depends on the segment electrical characteristics.

SuggestedRemedy

Add text toreflect the actual limiting characteristics for CSMA/CD and for PLCA (size of address field? Cycle time?)

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter wrote current text allows unlimited number of stations on the mixing segment, while this is not the case.
What the text (in this paragraph) is trying to say are the following:
- Explicit mentioning of the objectives:
- General geometry (reach, stubs)
- The fact that network implementer may go beyond these figures, given that specific (listed) ciretia are met

Cl **147** *SC* **147.2** *P* **169** *L* **22** # i-43

Yseboodt, Lennart Signify

Comment Type **E** *Comment Status* **D** *Editorial*

In Figure 147-2, the "PCS" and "PMA" text fields have been scaled incorrectly (probably the text field was grouped with the box and scaled as a group).

SuggestedRemedy

Reformat the text to have a correct width/height ratio.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.2.1.1** *P* **170** *L* **11** # i-280

Huszak, Gergely Kone

Comment Type **T** *Comment Status* **D** *Primitives*

It is not clearly specified what PMA_RX should do when line is idle and if it is implemented so that it does nothing, it may leave PCS_RX FSM stranded (stuck in an unintended state, e.g. DATA) e.g. if transmitting station gets powered down unexpectedly.

SuggestedRemedy

Add the following new sentence to the end of paragraph that ends at 170/17: "If the PMA Receive function does not detect activity on the line, it conveys the special 5B symbol SILENCE by the means of this primitive."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add new third paragraph to 147.4.3 PMA Receive function (page 191 line 54):
====
The PMA Receive function interprets the signals at the MDI using the inverse mapping described in 147.4.2 for the PMA Transmit function and transfers the 5B code groups specified in Table 147-1 to the PCS as rx_sym. When the PMA Receive function does not detect activity on the line, it shall convey the symbol 'I' (meaning SILENCE) as rx_sym.
====

Cl **147** *SC* **147.2.2.1** *P* **170** *L* **35** # i-202

Griffiths, Scott — Rockwell Automation

Comment Type **E** *Comment Status* **D** *Primitives*

"Simultaneously" is unclear here.

SuggestedRemedy

Either specify what is occuring simultaneously, or remove the word "simultaneously".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Remove the word simultaneously, by changing this:
====
During transmission, the PMA_UNITDATA.request simultaneously conveys to the PMA, via the parameter
tx_sym, the value of the symbol to be sent over the MDI.
====
to this:
====
During transmission, the PMA_UNITDATA.request conveys the value of the symbol to be sent over the MDI, via the parameter tx_sym.
====

Cl **147** *SC* **147.2.4.1** *P* **171** *L* **28** # i-203

Griffiths, Scott — Rockwell Automation

Comment Type **T** *Comment Status* **D** *Primitives*

Shouldn't link_control disable/enable only the PMA, and not the entire PHY? If there is there no reason to not disable the PCS when disabling the PMA, then the distinction is unimporant, but this is not clear to me.

SuggestedRemedy

Change PHY on lines 28 and 29 to PMA.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
If the PMA gets no input from the PCS (that is being reset), the PHY is disabled.

Cl **147** *SC* **147.3.2.1** *P* **175** *L* **1** # i-156

Zimmerman, George — ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *Editorial*

The PCS transmit state diagram should be in its own subclause, after the definitions of variables, constants, functions, abbreviations, and timers.

SuggestedRemedy

Create new Subclause 147.3.2.8 after 147.3.2.7 Timers, and anchor Figures 147-4 and 147-5 there.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.1** *P* **175** *L* **7** # i-286

Beruto, Piergiorgio — Canova Tech S.r.l.

Comment Type **E** *Comment Status* **D** *State Diagram*

In Figure 147-4 in the SILENT state, the tx_sym variable is assigned to the tx_cmd variable. However, if the tx_cmd variable changes to a value other than COMMIT, the tx_sym variable is not updated
as a result of a missing recirculating arc on the SILENT state.
This is not the intended behavior as the tx_cmd is used to convey HB or BEACON signaling while
the PCS Transmit State Diagram is still in SILENT state.

SuggestedRemedy

In Figure 147-4 add a recirculating arc to the silent state with the following condition:
STD * !pcs_txen * tx_cmd != COMMIT
with editorial license to format the expression according to IEEE style manual.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.1** *P* **176** *L* **25** # i-317

Baggett, Tim — Microchip Technology, Inc.

Comment Type **E** *Comment Status* **D** *State Diagram*

The exit conditions from state BAD_ESD in the PCS transmit state diagram in Figure 147-5 has caused some confusion and could be clarified. The exit condition from BAD_ESD to UNJAB_WAIT is: (STD * !err * xmit_max_timer_done). However, the exit condition from BAD_ESD to connector [B] is simply STD. Some readers have interpreted that the transition from BAD_ESD to [B] would always be taken, rather than and "ELSE" type condition.

The exit conditions could be made more clear by changing the condition to transition from BAD_ESD to [B] to be the complement of the transition condition from BAD_ESD to UNJAB_WAIT. Essentially, we only want to transition from BAD_ESD:

* to UNJAB_WAIT if xmit_max_timer_done is true (indicating a jabber and transmitting ESDJAB)
* to [B] if there was an error (and transmitting ESDERR).

SuggestedRemedy

Change the transition condition from BAD_ESD to the connector [B] from "STD" to "STD * err"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.1** *P* **176** *L* **31** # i-420

Law, David — Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *State Diagram*

Suggest that an approach similar to that found in IEEE Std 802.3-2018 Figure 28-18 'Arbitration state diagram' is used to mark the optional transition in Figure 147-5 'PCS Transmit state diagram'.

SuggestedRemedy

[1] Delete the text '(optional)'.
[2] Place a dashed box around the transition out of the UNJAB_WAIT and mark the box 'Optional Implementation'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.2** *P* **177** *L* **22** # i-183

Xu, Dayin — Rockwell Automation

Comment Type **E** *Comment Status* **D** *PCS*

There is no definition of "COMMAND" state in PCS Transmit function.

SuggestedRemedy

Delete the sentence "5B symbol to be transmitted when the PCS Transmit function is in COMMAND state."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
RESOLVED BY COMMENT i-369, THE PROPOSED RESPONSE OF WHICH IS AS FOLLOWS:
>>>>
PROPOSED ACCEPT IN PRINCIPLE.
1. Change the definition of tx_cmd to read:
====
tx_cmd
Encoding present on TXD<3:0>, TX_ER, and TX_EN as defined in Table 22-1.
Values:
BEACON: PLCA BEACON indication encoding present on TXD<3:0>, TX_ER, and TX_EN.
COMMIT: PLCA COMMIT indication encoding present on TXD<3:0>, TX_ER, and TX_EN.
SILENCE: TXD<3:0> does not encode any of the above requests, or TX_ER = FALSE, or TX_ER = TRUE.
====
2. Add the following to 147.3.2.4 changing the title to 'Functions':
====
TXCMD_ ENCODE
In the PCS transmit process, this function takes as its arguments the values of tx_cmd and hb_cmd variables and returns a 5B symbol based on the following mapping:
'N' when the tx_cmd variable is set to BEACON,
'J' when the tx_cmd variable is set to COMMIT,
'T' when the hb_cmd variable is set to HEARTBEAT and the tx_cmd variable is not set to BEACON or COMMIT,
'I' otherwise.
====
3. Change the action 'tx_sym <= tx_cmd' in the SILENT state of Figure 147-4 'PCS Transmit state diagram' to read 'tx_sym <= TXCMD_ ENCODE(tx_cmd, hb_cmd)'.
<<<<

Cl **147** *SC* **147.3.2.2** *P* **177** *L* **22** # i-369

Law, David — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *PCS*

The description for tx_cmd as '5B symbol to be transmitted' doesn't seem to match some of its uses in Figure 147-4 'PCS Transmit state diagram' where it is used as part of the condition for a state transition and in an IF-THEN-ELSE is a state. These are the transition from the SILENT state to the COMMIT state that includes tx_cmd = COMMIT, and in the ESD state where actions depend on tx_cmd != COMMIT. In these cases, tx_cmd would appear to be the command being conveyed from a PLCA RS to the PHY via the MII. This seems to be confirmed by the text 'The tx_cmd variable is assigned according to the RS signaling over MII interface ...' in the tx_cmd variable description.

There is then the action tx_sym <= tx_cmd in the SILENT state but that seems to need a function to translate the value of tx_cmd, as well as hb_cmd, to determine the symbol to send.

Finally, I can't find the COMMAND state mentioned in the text '... when the PCS Transmit function is in COMMAND state.' of the tx_cmd variable description.

SuggestedRemedy

[1] Change the definition of tx_cmd to read:

tx_cmd
Encoding present on TXD<3:0>, TX_ER, and TX_DV as defined in Table 22-1.
Values:
BEACON: PLCA BEACON indication encoding present on TXD<3:0>, TX_ER, and TX_DV.
COMMIT: PLCA COMMIT indication encoding present on TXD<3:0>, TX_ER, and TX_DV.

[2] Define when tx_cmd is set to SILENCE.

[3] Add the following to 147.3.2.4 changing the title to 'Functions':

TXCMD_ ENCODE
In the PCS transmit process, this function takes as its arguments the values of tx_cmd and hb_cmd variables and returns a 5B symbol based on the following mapping:

'N' when the tx_cmd variable is set to BEACON,
'J' when the tx_cmd variable is set to COMMIT,
'T' when the hb_cmd variable is set to HEARTBEAT and the tx_cmd variable is not set to BEACON or COMMIT,
'I' otherwise.

[4] Change the action 'tx_sym <= tx_cmd' in the SILENT state of Figure 147-4 'PCS Transmit state diagram' to read 'tx_sym <= TXCMD_ ENCODE(tx_cmd, hb_cmd)'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
1. Change the definition of tx_cmd to read:
====
tx_cmd
Encoding present on TXD<3:0>, TX_ER, and TX_EN as defined in Table 22-1.
Values:
BEACON: PLCA BEACON indication encoding present on TXD<3:0>, TX_ER, and TX_EN.
COMMIT: PLCA COMMIT indication encoding present on TXD<3:0>, TX_ER, and TX_EN.
SILENCE: TXD<3:0> does not encode any of the above requests, or TX_ER = FALSE, or TX_ER = TRUE.
====
2. Add the following to 147.3.2.4 changing the title to 'Functions':
====
TXCMD_ ENCODE
In the PCS transmit process, this function takes as its arguments the values of tx_cmd and hb_cmd variables and returns a 5B symbol based on the following mapping:
'N' when the tx_cmd variable is set to BEACON,
'J' when the tx_cmd variable is set to COMMIT,
'T' when the hb_cmd variable is set to HEARTBEAT and the tx_cmd variable is not set to BEACON or COMMIT,
'I' otherwise.
====
3. Change the action 'tx_sym <= tx_cmd' in the SILENT state of Figure 147-4 'PCS Transmit state diagram' to read 'tx_sym <= TXCMD_ ENCODE(tx_cmd, hb_cmd)'.

Cl **147** *SC* **147.3.2.2** *P* **177** *L* **34** # i-184

Xu, Dayin — Rockwell Automation

Comment Type **E** *Comment Status* **D** *PCS*

It is not 100% correct to say "... directly passed from tx_cmd in SILENT state ..." because tx_cmd is also used in "COMMIT", "SYNC" state.

SuggestedRemedy

Delete " in SILENT state" from the sentence "... directly passed from tx_cmd in SILENT state ...".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.2** *P* **177** *L* **38** # i-128

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

..., it indicates a transmission is ongoing. (add "that")

SuggestedRemedy

..., it indicates that a transmission is ongoing.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
CRG disagrees with the commenter.
Current text is correct.
According to the IEEE style guide, 'that' is best reserved for essential clauses.

Cl **147** *SC* **147.3.2.2** *P* **177** *L* **49** # i-172

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *EZ*

"When Auto-Negotiation is not present or enabled" seems logically incorrrect.

SuggestedRemedy

Change to "When Auto-Negotiation is not present or Auto-Negotiation is disabled,"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.3** *P* **178** *L* **3** # i-185

Xu, Dayin Rockwell Automation

Comment Type **E** *Comment Status* **D** *EZ*

The constant COMMIT is not defined in 147.3.2.3.

SuggestedRemedy

Change "SYNC" to "SYNC/COMMIT" to match the definition in Table 147-1

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
RESOLVED BY COMMENT i-129, THE PROPOSED RESPONSE OF WHICH IS AS FOLLOWS:
>>>>
PROPOSED ACCEPT.
Change SYNC to SYNC / COMMIT.
<<<<

Cl **147** *SC* **147.3.2.3** *P* **178** *L* **3** # i-129

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

'J' is not only used for SYNC, but also for COMMIT

SuggestedRemedy

Change SYNC to SYNC / COMMIT.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.3** *P* **178** *L* **8** # i-130

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *PCS*

'T' is not only used for ESD, but also for HB.

SuggestedRemedy

Change ESD to ESD / HB.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
HB is not used in the PCS Transmit State diagram for which 147.3.2.3 defines constants, so it is not appropriate here.
For the wider context "Table 147-1-4B/5B Encoding" clearly states T being both ESD and HB.

Cl **147** *SC* **147.3.2.4** *P* **179** *L* **10** # i-247

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PCS*

The non-data entries in his table should be conditional on access method and marked as such.

SuggestedRemedy

Those codes not used in CSMA/CD should be marked as "Reserved" when in CSMA/CD mode.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
As a PHY, proper implementation of layering requires support of the codes provided via the MII, and the table indicates encoding of the various codes which may be present at the MII, as specified in Clause 22 of this amendment.
Commenter would break layering by specifying the PHY act differently based on what he posits as a MAC-layer parameter in other comments.

Cl **147** *SC* **147.3.2.5** *P* **179** *L* **22** # i-370

Law, David Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *PCS*

As illustrated in Figure 147-2 '10BASE-T1S PHY interfaces' and Figure 147-3 'PCS reference diagram', and defined in IEEE Std 802.3-2018 subclause 22.2.2.1, TX_CLK is sourced from the PHY to the RS. Despite this, I was unable to find a specification of TX_CLK in Clause 146. Suggest that TX_CLK is generated from a symb_timer and STD is an alias for symb_timer_done.

SuggestedRemedy

[1] Insert a new subclause 147.3.2.5 titled 'Timer' that reads as follows, renumber subsequent subclauses as required.

5B_symb_timer
A continuous free-running timer. PMA_UNITDATA.request messages are is issued by the PCS concurrently with 5B_symb_timer_done. TX_CLK (see 22.2.2.1) shall be generated from 5B_symb_timer with the rising edge of TX_TCLK generated synchronously with 5B_symb_timer_done.
Duration: Five DME clock transition to clock transition times (see Table 147-3)

[2] Change current subclause 147.3.2.5 'Abbreviations' to read:

STD
Alias for 5B_symb_timer_done.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
RESOLVED BY COMMENT i-2, THE PROPOSED RESPONSE OF WHICH IS AS FOLLOWS:
>>>>
PROPOSED ACCEPT.
Do the following 2 changes:
- Insert new timer to the end of 147.3.2.7 with the following content and using the regular timer definition layout/formatting::
====
5B_symbol_timer
The 5B_symbol_timer shall be generated synchronously with PCS transmit clock TX_CLK.
Continuous timer: The condition 5B_symbol_timer_done becomes true upon timer expiration.
Restart time: Immediately after expiration, timer restart resets the condition 5B_symbol_timer_done.
Duration: Five DME clock transitions (see Table 147-2).
====
- Change the definition of STD in 147.3.2.5:
from:
====
Alias for 5B symbol timer done, synchronous to PCS TX clock.
====
to:
====
Alias for 5B_symbol_timer_done.
====
<<<<

Cl **147** *SC* **147.3.2.** *P* **179** *L* **26** # i-2

Huszak, Gergely Kone

Comment Type **T** *Comment Status* **D** *PCS*

The proper definition of STD is lacking.

SuggestedRemedy

Do the following 2 changes:
- Insert new timer to the end of 147.3.2.7 with the following content and using the regular timer definition layout/formatting::
====
5B_symbol_timer
The 5B_symbol_timer shall be generated synchronously with PCS transmit clock TX_CLK.
Continuous timer: The condition 5B_symbol_timer_done becomes true upon timer expiration.
Restart time: Immediately after expiration, timer restart resets the condition 5B_symbol_timer_done.
Duration: Five DME clock transitions (see Table 147-2).
====
- Change the definition of STD in 147.3.2.5:
from:
====
Alias for 5B symbol timer done, synchronous to PCS TX clock.
====
to:
====
Alias for 5B_symbol_timer_done.
====

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.6** *P* **179** *L* **27** # i-157

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *Editorial*

The subclause for the self-synchronizing scrambler does not belong in the middle of the subclauses defining abbreviations and timers for the state diagram

SuggestedRemedy

Move 147.3.2.6 immediately prior to 147.3.2.8 Jabber functional requirements so that it is after all the PCS Transmit state diagram material (adjusting the numbers for any rearrangements as necessary)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.6** *P* **179** *L* **35** # i-131

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

... of Scrn[13], Scrn[16] and TXD[i] ... (add serial comma)

SuggestedRemedy

... of Scrn[13], Scrn[16], and TXD[i] ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.2.8** *P* **180** *L* **16** # i-173

Zimmerman, George ADI, APL Group, Aquantia, BMW, Cisco, Commscop

Comment Type **E** *Comment Status* **D** *EZ*

"or it can keep silent until reset." - this is unusual language for allowed behavior - "may" is more appropriate

SuggestedRemedy

Change "can" to "may"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.3.1** *P* **180** *L* **29** # i-195

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type **E** *Comment Status* **D** *PICS*

Non-required "shall".

SuggestedRemedy

Replace "which shall instead be used" with "which can be used".
At page 208, line 9, delete the PCSR2 entry from the PICS.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.3.2** *P* **180** *L* **53** # i-423

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Not sure why the variable to represent the RX_DV signal of the MII is named pcs_rxdv, RX_ER is named pcs_rxer and RXD named pcs_rxd in the PCS Receive state diagram, particularly when the Figure 147-10 'Heartbeat transmit state diagram' uses COL for the MII signal COL, CRS for CRS and RX_DV for RX_DV.

SuggestedRemedy

Suggest that in Figure 147-7 and 147-8:

[1] pcs_rxdv is renamed RX_DV.
[2] pcs_rxer is renamed RX_ER.
[2] pcs_rxd is renamed RXD.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
1. Do as the commenter's suggested remedy says (3 steps)
2. At 180/52-53 change "pcs_rxdv" to "RX_DV"
3. At 181/1 change "pcs_rxer" to "RX_ER"
4. At 181/3-4 change "pcs_rxd" to "RXD"
5. Change "pcs_txen" to "TX_EN" and "pcs_txer" to "TX_ER" in "Figure 147-4-PCS Transmit state diagram (part a)" and in "Figure 147-5-PCS Transmit state diagram (part b)"
6. At 177/6-7 change "pcs_txen" to "TX_EN"
7. At 177/12 change "pcs_txer" to "TX_ER"
8. At 177/17-18 change "pcs_txd" to "TXD"
9. At 177/43-44 change "pcs_txer = TRUE" to "TX_ER = TRUE"
10. Change "pcs_txdn" to "TXDn" in "Figure 147-5-PCS Transmit state diagram (part b)", where "n" is a lower-index letter n

Cl **147** *SC* **147.3.3.4** *P* **181** *L* **23** # i-281

Huszak, Gergely Kone

Comment Type **T** *Comment Status* **D** *State Diagram*

Descrambler needs 17 bits to lock and that is achieved by receiving 5 symbols.
Descrambler is fed by 4B symbols, so DECODE must be called to be able to do the feeding.
According to the current specification of the PCS_RX FSM, DECODE is called only in DATA state.
If it is done this way, the first 5 actual data symbols would be garbage, as descrambler is not yet locked.
A fix is to spec PCS_RX so, that this DECODE-and-feed task is already run in PRE state, so that by the time DATA state is reached, meaningful descrambling could be done, using the descrambler locked previously.
Moreover it is not specified what descrambler is to be fed, when DECODE fails.

SuggestedRemedy

1. Add the following sentence to the end of the paragraph that ends 181/23 (replacing its closing dot): ", and the return value of this function is implementation-dependent."
2. Add the following new condition to the end of the current content of PCS_RX/PRE:
====
IF precnt > 3 THEN
<tab>DECODE(RXn-3)
END
====
Note: the index "-3" in RXn-3 already incorporates the comment that is submitted by Piergiogio Beruto tagged INDEX

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.3.5** *P* **181** *L* **26** # i-3

Huszak, Gergely Kone

Comment Type **T** *Comment Status* **D** *PCS*

The proper definition of RSCD is lacking.

SuggestedRemedy

Do the following 2 changes:
- Create a new subclause "147.3.3.8 Timers" (let 147.3.3.8-10 renumber automatically) and insert the following text underneath using the regular timer definition layout/formatting:
====
receive_symbol_conversion_timer
The receive_symbol_conversion_timer shall be generated synchronously with the PCS receive clock.
Continuous timer: The condition receive_symbol_conversion_timer_done becomes true upon timer expiration.
Restart time: Immediately after expiration, timer restart resets the condition receive_symbol_conversion_timer_done.
Duration: Five receive DME clock transitions (see Table 147-2).
====
- Change the definition of RSCD in 147.3.3.5:
from:
====
Alias for Receive Symbol Conversion Done, synchronous to PCS RX clock.
====
to:
====
Alias for receive_symbol_conversion_timer_done.
====

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.3.5** *P* **181** *L* **27** # i-32

Marris, Arthur — Cadence Design Systems, Inc.

Comment Type **TR** *Comment Status* **D** *PCS*

Definition of RSCD is not adequate

SuggestedRemedy

"RSCD indicates a new symbol has been decoded and is available for processing in the state diagram."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
RESOLVED BY COMMENT i-3, THE PROPOSED RESPONSE OF WHICH IS AS FOLLOWS:
>>>>
PROPOSED ACCEPT.
Do the following 2 changes:
- Create a new subclause "147.3.3.8 Timers" (let 147.3.3.8-10 renumber automatically) and insert the following text underneath using the regular timer definition layout/formatting:
====
receive_symbol_conversion_timer
The receive_symbol_conversion_timer shall be generated synchronously with the PCS receive clock.
Continuous timer: The condition receive_symbol_conversion_timer_done becomes true upon timer expiration.
Restart time: Immediately after expiration, timer restart resets the condition receive_symbol_conversion_timer_done.
Duration: Five receive DME clock transitions (see Table 147-2).
====
- Change the definition of RSCD in 147.3.3.5:
from:
====
Alias for Receive Symbol Conversion Done, synchronous to PCS RX clock.
====
to:
====
Alias for receive_symbol_conversion_timer_done.
====
<<<<

Cl **147** *SC* **147.3.3.6** *P* **182** *L* **4** # i-421

Law, David — Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *PCS*

The variables link_control and transmitting are used in Figure 147-7 'PCS Receive state diagram' but are not listed in subclause 147.3.3.2 'Variables'.

SuggestedRemedy

Suggest that the following are added to subclause 147.3.3.2 'Variables'.

link_control
See 147.3.2.2.

transmitting
See 147.3.2.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.3.6** *P* **183** *L* **5** # i-319

Beruto, Piergiorgio — Canova Tech S.r.l.

Comment Type **T** *Comment Status* **D** *State Diagram*

tag [INDEX]
The function DECODE(RXn-4) should be checking RXn-3, not RXn-4.
If it checks RXn-4, it would decode one less nibble than it ought to when evaluating the arc to GOOD_ESD state.

SuggestedRemedy

In Figure 147-8 In the DATA state change RXn-4 to RXn-3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.3.6** *P* **183** *L* **12** # i-278

Huszak, Gergely Kone

Comment Type **T** *Comment Status* **D** *State Diagram*

Conditions on DATA->BAD_ESD and DATA->GOOD_ESD should be mutually exclusive, but those are not.
Implementations would work, due to the usual if - else construct, however this leaves space for implementation-dependent divergence in PHY behavior.

SuggestedRemedy

1. Change the condition on DATA->BAD_ESD from:
====
RSCD *
(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK) + RXn-3 = SILENCE)
====
to:
====
RSCD *
(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK * RXn-3 != ESD * RXn-3 != ESDBRS) + RXn-3 = SILENCE)
====
2. Change the condition on DATA->DATA from:
====
RSCD *
!(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK) + RXn-3 = SILENCE) *
!((RXn-3 = ESD + RXn-3 = ESDBRS) * RXn-2 = ESDOK)
====
to:
====
RSCD *
!(((RXn-2 = ESD + RXn-2 = ESDBRS) * RXn-1 != ESDOK * RXn-3 != ESD * RXn-3 != ESDBRS) + RXn-3 = SILENCE) *
!((RXn-3 = ESD + RXn-3 = ESDBRS) * RXn-2 = ESDOK)
====
Note: Separate comment on changing all the indexes in the RXn-# notation on all 3 exist conditions from DATA was submitted. Consider these comments together.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.5** *P* **184** *L* **27** # i-248

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PCS*

The text of this sub-clause does not meet the fundamental functional requirements of a bussed CSMA/CD system (Ref.: cl. 8.2 c)). It is just flat out incorrect. The last sentence of the 1st paragraph is technically incorrect. Statement a) is technically incorrect. Statement b) is true but technically insignificant to the operation of a MAC.

SuggestedRemedy

Add a full specification for Collison Detect that meets the full Ethernet requirements for function, reliability and timing.

Proposed Response *Response Status* **W**

PROPOSE REJECT.
The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.
Commenter fails to adequately explain the problem and does not provide a sufficient remedy.

Cl **147** *SC* **147.3.5** *P* **184** *L* **30** # i-417

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PCS*

[CSD/Compatibility] [Collision Detect, no assurance thereof]
In IEEE 802.3 project where CSMA/CD ("half-duplex") is supported, the collision detection method always has been specified, AND the assurance of 100% collision detection has been obvious, i.e. DC bias voltage rise from two or more transmitters using current source into a known resistance, or simple logical AND function of PMA TXD enable and RXD enable. This project, however, does not specify any collision detection method except to say 1) data corruption == collision, and 2) require, without specification, find two or more stations transmitting somewhere in the network and assert CRS during that time.

We all know what collision condition is, 'two or more simulanous transmittion into a shared collision domain" or there about. It is the responsibility of the project to specify how this is done, and also assure us that collision detection confidence is at least ar PAR with prior projects. This project does not specify the collsion detection method; therefore, it is incomplete.

That said, there are tactical issues with the current draft, and I do not wish to indicate that fixing any of these tactical issues would be satisfactory to requiring 100% assurance of collision detect. But here goes.
1) "corrupted signal while transmitting" == collision. This has an obvious flaw that one station may see random bit-error (e.g. from a local noise hit) and detect collision and backs-off, the other station does not see a collision 'corrupted signal while tranmitting" and completes transmission. Some receivers may see errored frames, some may not see errored frame. Result = non-determinstic behavior and lost packet.
2) Local strong TX and remote weak TX may not assure corruption.
- Max Attenuation: Attenuation of the TX signal on the nominal-length worst-case channel is 65% (3.7 db)
- Max TX power of local, so +20% P-P from 147.5.4.1 transmit output voltage is 1V +/- 20% P-P. + minimum droop and power spectral density (highest power allowed).
- Min TX power of remote, so -20% P-P, with max droop.
so power diff give another ~66%. Or ~43% max interference from remote, and it could be as little as ~35% considering droop.

In addition, COL assertion within 256 bit times from the begining of a transmission seems insufficient -- a minimum collision duration is 96 bit times. A min collision + IPG would allow a new transmission to occur at 192 bit times from the initial collision. So allowing collisoin to assert up to 256 bit time later, would potentially affect the subsequent packet transmission.

Without receiver specification we have NO CLUE how receiver would behave -- whether or not data corruption would be detected from the worst case remote TX interference.. And we've opted for TX and channel spec and leave RX to implementors to *recover* tx data over channel.

From 147.3.5 Collision Detection:
"When operating in half-duplex mode, the 10BASE-T1S PHY shall detect when a transmission initiated locally results in a corrupted signal at the MDI as a collision. When collisions are detected, the PHY shall assert the signal COL on the MII for the duration of the collision or until TX_EN signal is FALSE. The method for detecting a collision is implementation dependent but the following requirements have to be fulfilled. ..... a) The PHY shall assert COL within 256 bit times from the beginning of a transmission when one or more stations are transmitting at the same time.
b) The PHY shall assert CRS in the presence of a signal resulting from a collision between two or more stations."

SuggestedRemedy

The draft is incomplete without 100% collision detection specification. 100% defined to be as obvious as prior 802.3 CSMA/CD PHY projects. Please complete the draft by including collision detection specification.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Comment appears to comment on multiple issues.
1. With regards to the 256 bit times delay in asserting COL, at 184/35-37 change this:
====
The PHY shall assert COL within 256 bit times from the beginning of a transmission when one or more stations are transmitting at the same time.
====
to this:
====
The PHY shall assert COL when one or more stations are transmitting at the same time.
====
effectively removing "within 256 bit times from the beginning of a transmission".
This proposed resolution to comment #i-45 clarifies the possible misinterpretation of this requirement.
2. CRG disagrees with the rest of commenter's statements.
Analysis has been presented (see http://www.ieee802.org/3/cg/public/adhoc/beruto_3cg_collision_detection.pdf) to address issues of existence, feasibility and reliability of collision detect (CD).
The highlights of this analysis relevant to this comment are:
- Target level of reliability (less-than-or-equal-to one miss-categorization per lifetime of universe) can be achieved based on the current specs.
- In the analogue domain, in presence of the specified Gaussian noise, reliable CD can be achieved. The commenter's calculation seems to confirm most of these (see commenter's figure compared to pages 4 and 5 of the study), but CRG has difficulty following commenter's calculations in full.
- Using the properties of the DME, the self-synchronizing scrambler and network geometry (reach, exclusion of the repeaters) and other properties of the Ethernet frame, the same can be achieved.
- At least one implementation exists that meet these requirements in specified noise environment.
THE PROPOSED RESPONSE OF #i-45 IS AS FOLLOWS:
>>>>
PROPOSED ACCEPT.
Change the "event" in Row 6 (Lines 43-45) from:
"COL input to CRS asserted"

to:
"MDI input to COL asserted"
==
Change the "Output timing reference" in Row 6 (Lines 43-45) from:
"Rising edge of CRS"
To:
"Rising edge of COL"
==
Change the "event" in Row 7 (Lines 46-47) from:
"COL input to CRS deasserted"
to:
"MDI input to COL deasserted"
==
Change the "Output timing reference" in Row 7 (Lines 46-47) from:
"Rising edge of CRS"
To:
"Rising edge of COL"
http://www.ieee802.org/3/cg/comments/Comment_i-45_Baggett_3cg_Table_147-6_typo_errors.pdf
<<<<

Cl **147** *SC* **147.3.3.10** *P* **185** *L* **10** # i-414

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PCS*

Generation of Commit indication states PHY shall notify RS of received Commit by the means of MII interface in 22.2.2.8. This statement makes support of PLCA RS in 10BASE-T1S PHY not optional. PLCA RS is advertised as optional RS. The use of COMMIT (in proposed changes to CL22) requires support of the optional RS, but this clause does not specify the optional RS bevior. This and two other shalls in this subclause makes it mandatoy implementation in all 10BASE-T1S PHYs.

SuggestedRemedy

Delete CL147.3.3.10 requirements.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter is incorrect.
The decoding and signaling of the COMMIT and BEACON indications, and presentation of the signaling onto the MII does not make support of PLCA mandatory.
When the PLCA is not enabled or not supported, RS operation shall conform to C22, which would cause the signals to be ignored because the state diagrams they effect are not implemented.
See also 215/51 ("148.4.2 Reconciliation Sublayer operation").

Cl **147** *SC* **147.3.7.1** *P* **185** *L* **13** # i-132

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

..., while the slave PHY replies back to received HB signals. (redundant wording)

SuggestedRemedy

..., while the slave PHY replies to received HB signals.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
While "reply back" indeed is somewhat redundant, it is a valid expression and appropriate for this sentence.

Cl **147** *SC* **147.3.7.1** *P* **185** *L* **15** # i-416

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PCS*

WRT ".. and Auto-Negotiation has achieved a good link." Auto-negotiation never achieves a good link. Auto-negotiation only negotiates capabilities.

SuggestedRemedy

Either delete the quoted text, or revise the text to describe appropriate condition while correcting for the error.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter is incorrect.
The term "good link" ("link good") is used to describe establishment of auto negotiation communications in the state machines describing autonegotiation in clauses 28, 73, and 98.
IEEE-SA style manual 10.2.1 Homogeneity recommends using uniform terminology in the standard.

Cl **147** *SC* **147.3.7.1** *P* **185** *L* **19** # i-412

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PCS*

WRT to "When the PHY is not in multidrop mode and a BEACON is received either over the MII or from the line, the state diagram in Figure 147-10 enters the DISABLE_HB state and stays there until PCS Reset is asserted,...". This statement makes support of PLCA RS in 10BASE-T1S PHY (current all three of 10BASE-T1S PHYs) not optional. PLCA RS is advertised as optional RS. The recognition of BEACON (in proposed changes to CL22) requires support of the optional RS, but this clause does not specify the optional RS bevior. This and two other shalls in this subclause makes it mandatoy implementation in all 10BASE-T1S PHYs.

SuggestedRemedy

Delete CL147.3.7.1 requirements.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter is incorrect.
The decoding and signaling of the COMMIT and BEACON indications, and presentation of the signaling onto the MII does not make support of PLCA mandatory.
When the PLCA is not enabled or not supported, RS operation shall conform to C22, which would cause the signals to be ignored because the state diagrams they effect are not implemented.
See also 215/51 ("148.4.2 Reconciliation Sublayer operation").

Cl **147** *SC* **147.3.7.1** *P* **185** *L* **19** # i-413

Kim, Yongbum NIO

Comment Type **ER** *Comment Status* **D** *PCS*

"... a BEACON is received..." the word "BEACON" is used without any x-reference, and the nature of 'BEACON' (signal?, state?, interface?, etc) is found in other clauses.

SuggestedRemedy

Please insert x-ref to 'BEACON'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change this:
====
When the PHY is not in multidrop mode and a BEACON is received either over the MII or from the line
====
to this:
====
When the PHY is not in multidrop mode and a BEACON request is received from the MII (See Table 22-2) or a BEACON code-group is received from the line (See Table 147-1)
====

Cl **147** *SC* **147.3.7.1.1** *P* **185** *L* **35** # i-422

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

Values are not defined for the multidrop variable.

SuggestedRemedy

Add 'Values: TRUE or FALSE' to the end of the multidrop variables in subclause 147.3.7.1.1 'Variables'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.7.1.1** *P* **185** *L* **37** # i-371

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *EZ*

There isn't a subclause 98.2.1.5 in IEEE Std 802.3-2018, suggest this should be to subclause 98.2.1.2.5.

SuggestedRemedy

Change the text '... method in 98.2.1.5 and ...' to read '... method in 98.2.1.2.5 and ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.7.1.1** *P* **185** *L* **43** # i-133

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

... is being sent or an higher priority request is ... ("a/an" distinction)

SuggestedRemedy

... is being sent or a higher priority request is ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.7.1.1** *P* **185** *L* **51** # i-415

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PCS*

WRT to "..rx_cmd <= 'COMMIT' when a COMMIT indication is generated as specified".
This statement makes support of PLCA RS in 10BASE-T1S PHY not optional. PLCA RS is advertised as optional RS. The use of COMMIT (in proposed changes to CL22) requires support of the optional RS, but this clause does not specify the optional RS bevior. This and two other shalls in this subclause makes it mandatoy implementation in all 10BASE-T1S PHYs.

SuggestedRemedy

Delete CL147.3.7.1.1 requirements.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter is incorrect.
The decoding and signaling of the COMMIT and BEACON indications, and presentation of the signaling onto the MII does not make support of PLCA mandatory.
When the PLCA is not enabled or not supported, RS operation shall conform to C22, which would cause the signals to be ignored because the state diagrams they effect are not implemented.
See also 215/51 ("148.4.2 Reconciliation Sublayer operation").

Cl **147** *SC* **147.3.7.1.1** *P* **185** *L* **52** # i-134

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

... when a HB is detected on the line. ("a/an" distinction)

SuggestedRemedy

... when an HB is detected on the line. (if we alternatively decide to read this as a HEARTBEAT then on the same side in line 41 "an HB message" needs to be changed to "a HB message").

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.7.1.1** *P* **185** *L* **54** # i-135

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

BEACON, COMMIT, HEARTBEAT or NONE (add serial comma)

SuggestedRemedy

BEACON, COMMIT, HEARTBEAT, or NONE

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.3.7.1.3** *P* **186** *L* **5** # i-249

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *EZ*

The state diagram can be significantly compacted vertically with no loss in clarity.

SuggestedRemedy

Move the WAIT_TX state from the left column to the right column above REPLY_HB and move both boxes up.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Editorial license to compact this figure.

Cl **147** *SC* **147.3.7.1.3** *P* **187** *L* **3** # i-424

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *EZ*

The values for pcs_reset defined in subclause 147.3.2.2 'Variables' are 'ON or OFF'. As a result, pcs_reset needs to be tested against these values when used as part of a transition condition.

SuggestedRemedy

[1] On the open arrow entry to the INIT state change 'pcs_reset +' to read '(pcs_reset = ON) +'
[2] On the open arrow entry to the DISABLE_HB state change 'pcs_reset +' to read '(pcs_reset = OFF) +'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
1. At 172/39 change "while pcs_reset = OFF" to "while pcs_reset = FALSE"
2. At 172/44 change "pcs_reset = ON" to "pcs_reset = TRUE"
3. At 172/45 change "pcs_reset = OFF" to "pcs_reset = FALSE"
4. At 175/2 (in "Figure 147-4-PCS Transmit state diagram (part a)") change "pcs_reset = ON +" to "pcs_reset +"
5. At 177/5 change "Values: ON or OFF" to "Values: TRUE or FALSE"

Cl **147** *SC* **147.3.7.2** *P* **188** *L* **3** # i-250

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *EZ*

The leftmost transition into INACTIVE is confusing. It looks like it is an entrance from the text.

SuggestedRemedy

Put in a CR or, preferably, don't use a purely vertical transition line.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Editorial license to eliminate the visual artifact (top of hanging vertical line that goes into INACTIVE almost touches the 2nd underline in "link_hold_timer") as appropriate (without inserting CR to text).

Cl **147** *SC* **147.3.7.2** *P* **188** *L* **3** # i-429

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *EZ*

The values for pcs_reset defined in subclause 147.3.2.2 'Variables' are 'ON or OFF'. As a result, pcs_reset needs to be tested against these values when used as part of a transition condition.

SuggestedRemedy

On the open arrow entry to the INACTIVE state change 'pcs_reset +' to read '(pcs_reset = ON) +'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
RESOLVED BY COMMENT i-424, THE PROPOSED RESPONSE OF WHICH IS AS FOLLOWS:
>>>>
PROPOSED ACCEPT IN PRINCIPLE.
1. At 172/39 change "while pcs_reset = OFF" to "while pcs_reset = FALSE"
2. At 172/44 change "pcs_reset = ON" to "pcs_reset = TRUE"
3. At 172/45 change "pcs_reset = OFF" to "pcs_reset = FALSE"
4. At 175/2 (in "Figure 147-4-PCS Transmit state diagram (part a)") change "pcs_reset = ON +" to "pcs_reset +"
5. At 177/5 change "Values: ON or OFF" to "Values: TRUE or FALSE"
<<<<

Cl **147** *SC* **147.4** *P* **190** *L* **1** # i-204

Griffiths, Scott Rockwell Automation

Comment Type **T** *Comment Status* **D** *PMA*

PMA_CARRIER.indication is not shown in Figure 147-12. There is also no mention of this primitive or how it is generated in 147.4, which discusses the PMA.

SuggestedRemedy

Describe how PMA_CARRIER.indication is generated somewhere in 147.4, and add this primitive in the appropriate location in Figure 147-12.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add an arrow from "PMA RECEIVE" with "PMA_CARRIER.indication (pma_crs)" in "Figure 147-12-PMA functional block diagram" (PMA_CARRIER.indication itself is already described in "147.2.3 Mapping of PMA_CARRIER.indication" and its sub-clauses)

Cl **147** *SC* **147.4** *P* **190** *L* **31** # i-251

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *EZ*

In the sentence "The PMA provides either half duplex communications, or, optionally full duplex..." the word "either" is superficial given the presence of the word "optionally".

SuggestedRemedy

Remove the word "either" so that it reads: "The PMA provides half duplex communications, or, optionally full duplex..."

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The "either - or" grammatical construct is intended to pinpoint the very alternatives.

Cl **147** *SC* **147.4** *P* **190** *L* **32** # i-252

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *EZ*

The statement: "The PMA provides ... communications to and from medium employing DME." would lead one to believe that the medium provides the DME. Such is not the case.

SuggestedRemedy

Change to: "The PMA utilizes DME to provide either half duplex communications, or, optionally full duplex communications to and from the medium.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.4.2** *P* **191** *L* **11** # i-253

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *PMA*

In Fig. 147-13 the two figures are confusing because they are vastly different time scales. One figure shows the actual (idealized) signal transitions and the other shows the LF envelope of the signal.

SuggestedRemedy

Resolve the isue within the figure. I suggest grey-scaling within the transmission. (Unless what is being depicted on the second fig. Is 2 time scales, then their should be a two wiggly vertical discontinuity break in the middle of T1)

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter has not provided necessary and sufficient information for the problem and the fix it may deserve.

Cl **147** *SC* **147.5.1** *P* **193** *L* **1** # i-254

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *PMA Electrical*

This clause and its sub-clauses don't say anything useful to specify the conformance requirements for 10BASE-T1S Physical Layer implementation. Saying something "may" be relevant also means it "may not" be relevant. It also means it is not an element of a conformance requirement.

SuggestedRemedy

Replace with: Applications for the specified device commonly have additional requirements that limit its conducted radio frequency emission and its susceptibility to electromagnetic interference coupling to the cabling system. Such requirements are beyond the scope of this standard.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.
It is unclear exactly which part of the text the commenter wishes to replace.
Replacing the entire subclause and its subclauses would remove useful information for the application of the physical layer devices specified in this clause.

Cl **147** *SC* **147.5.2** *P* **193** *L* **33** # i-136

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **T** *Comment Status* **D** *Test Mode*

Test mode 3 - Transmitter distortion test and PSD mask (there is no transmitter distortion test, only a transmit PSD mask specification within Clause 147)

SuggestedRemedy

Test mode 3 - Transmitter PSD mask

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.5.5.1** *P* **196** *L* **40** # i-255

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *PMA Electrical*

"...and sent to the MII during normal..." Because of the inclusion PLCA as being within the scope of this project the term MII is ambiguous in the context of this draft as there are two reconciliation sublayers. This a result of the further confusion between the "PHY" and the "Physical Layer". Originally the RS was supposed to a functionally transparent block which only (a) did not interfere with access at all and (b) allowed the old physical interface (AUI) to move to a more logical division point (MII) in line with the evolution of technology over the twenty years from 1973 to 1993.

SuggestedRemedy

Either define two terms, one for each RS (e.g. DMII, AMII) or clearly state which RS is intended in each use of MII in this project's draft.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter is incorrect pointing out that the term MII is ambiguous in the context of this draft. The MII is the interface between the PHY and the RS, which both belong to the Physical Layer. In the context of C147 the MII is supposed to work with either C22 RS or Clause 148 RS (PLCA) seamlessly. C148 RS is specified to behave exactly as C22 RS when PLCA function is disabled.

Cl **147** *SC* **147.5.6** *P* **197** *L* **18** # i-256

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PMA Electrical*

I don't understand how the following text can be true: "The PMA local loopback function is optional" ...on a PMA where transmit is connected to receive.

SuggestedRemedy

Please clarify. I think you mean "The PMA local loopback test function is optional."

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The CRG disagrees with the commenter - text is clear - the PMA local loopback function is optional.
What this test mode does in
- half-duplex mode, is overriding part of the condition on the single-ended arrow that point into WAIT_SYNC in "Figure 147-7-PCS Receive state diagram", allowing receiving back transmitting station's own data.
- full-duplex mode, is suspending functionality that would prevent the transmitting station from receiving its own data.

Cl **147** *SC* **147.5.6** *P* **197** *L* **24** # i-257

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PMA Electrical*

The word "unterminated" here implies that loopback only works if there is no compliant link segment and other MAU connected but there is a requirement of some sort for some circuit characteristics at the MDI to guarantee the echo.

SuggestedRemedy

Clarify and specify

Proposed Response *Response Status* **W**

PROPOSED REJECT.
In full-duplex PMA loopback only works with unterminated link segment (If the line is terminated, then you don't get any signal back, the reflection coefficient is 0).
PMA loopback mode is meant for serving diagnostics purposes, used in a special mode, therefore collision is not a concern there.

Cl **147** *SC* **147.5.6** *P* **197** *L* **27** # i-258

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PMA Electrical*

The paragraph seems to assume that what is on the receive PMA is sufficiently well-formed to be to be decoded and converted to data. Since it is the sum of two or more signals that is not a valid assumption.

SuggestedRemedy

Add the following text: "During a collision (i.e. either a transmit collision or a receive collision) no assumptions whatsoever can be made about the validity or decodabilty of the waveform present at the input of the receiver."

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter is incorrect, as this subclause refers to PMA loopback mode, not to collision detection.
Text here makes no assumption with regards to the received signal (its shape, validity and so on) in the presence of collision.
The PMA Loopback is used for diagnostic purposes, and it is optional, thus current text is correct.

Cl **147** *SC* **147.5.6** *P* **197** *L* **31** # i-259

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PMA Electrical*

Paragraph 4 is not true. Add conditional text to make it true.

SuggestedRemedy

Precede the current text with: "In the absence of collision..."

Proposed Response *Response Status* **W**

PROPOSED REJECT.
This subclause is about "PMA Local Loopback", so it is a means for the MAC client to verify underlying circuitry. In case of collision, COL is raised and MAC client can act accordingly.

Cl **147** *SC* **147.6** *P* **197** *L* **38** # i-260

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Management*

I don't understand how the last sentence of this paragraph works in an actual implementation. I think a compliant (as opposed to interoperable in some fixed configuration) implementation is required to have control bits. Ifso, there has to be a way to test their existence and function. I don't see how you get there from the present text.

SuggestedRemedy

Put in a testable requirement to access the configurable aspects.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The identical language is used in several 802.3 clauses with respect to control, in particular in clause 45 which governs the registers.
Commenter is incorrect. While the implementation of the MDIO interface is optional, and an equivalent mechanism is recommended, the implementation is NOT required to have the control bits. An equivalent means of control and configuration (e.g., with a different encoding of bits, or with strap pins) would be permitted. The existing text allows this.

Cl **147** *SC* **147.6.1** *P* **197** *L* **47** # i-22

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *Editorial*

"10BASE-T1S" should not be split across two lines.

SuggestedRemedy

Change the hyphen to a non-breaking hyphen (Esc - h)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change all manifestations of "10BASE-T1S" (so excluding figures and titles) in the text to use NBH in c147, to prevent this problem from resurfacing in the future (when text is changed).

Cl **147** *SC* **147.7** *P* **198** *L* **4** # i-137

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

..., such as industrial, automotive and building automation ... (add serial comma)

SuggestedRemedy

..., such as industrial, automotive, and building automation ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.7.2** *P* **198** *L* **24** # i-138

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

In order to limit the noise at the receiver due to impedance mismatches each 10BASE-T1S ... (add comma after "mismatches")

SuggestedRemedy

In order to limit the noise at the receiver due to impedance mismatches, each 10BASE-T1S ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.7.4** *P* **198** *L* **51** # i-139

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Link Segment*

When multiple cable pairs are bundled, the alien XTALK (ANEXT and AFEXT) become interference sources. (needs to be singular)

SuggestedRemedy

When multiple cable pairs are bundled, the alien XTALK (ANEXT and AFEXT) becomes the interference source.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace sentence: When multiple cable pairs are bundled,
the alien XTALK (ANEXT and AFEXT) become interference sources.

With: Noise coupled between the disturbed 10BASE-T1S link segment and other disturbing 10BASE-T1S link
segments is referred to as alien crosstalk noise.

Cl **147** *SC* **147.8** *P* **199** *L* **26** # i-23

Anslow, Peter Ciena

Comment Type **E** *Comment Status* **D** *Editorial*

In "The 10BASE-T1S mixing segment (1.4.332) is..." the definition for "mixing segment" has been re-numbered from 1.4.332 to 1.4.331 due to the deletion of 1.4.294 by IEEE Std 802.3bt-2018.
Also, this is an external cross-reference.

SuggestedRemedy

Change "1.4.332" to "1.4.331" and apply character tag "External".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.8.1** *P* **199** *L* **52** # i-402

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *Mixing Segment*

The mixing segment shall meet the insertion loss characteristics specified for link segments in 147.7.1
between any two MDI attachment points. And from 147.8 "A mixing segment is specified based on cabling that supports up to at least 8 nodes and 25 m in reach". From both of this statement, this specification is requiring 28 (combination of any two) measurement taken. And any added nodes requires all combinations to be measured again, and with no assurances that the prior conformant MDI may fall out of range.

SuggestedRemedy

Provide better medium specifcation and cable design considerations that can be followed assured scaleable MDI and medium construction.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.
Further, the CRG disagrees with the commenter, as the commenter mistakes 147.8 explanatory text with the specification ("is specified" vs. "shall meet.").
It is common practice for cabling systems to be specified to be compliant by design rather than necessarily measured for each instance. Further, the characteristics required have been specified based on measurements indicating that they support the described topologies, an existence proof that design is feasible.

Cl **147** *SC* **147.8.2** *P* **200** *L* **4** # i-303

Schicketanz, Dieter University of Applied Science Reutlingen

Comment Type **E** *Comment Status* **D** *Mixing Segment*

There is a typo in the reference impedance for return loss

SuggestedRemedy

change 50 to 100

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The correct figure for mixing segment is indeed 50 (not 100), so current text is correct.

Cl **147** *SC* **147.9** *P* **200** *L* **12** # i-261

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *MDI*

Since the MDI connector that is called out is not required there is no standardized way or specifically characterized test point where specification or conformance testing can be done on a multi-vendor repeatable basis.

SuggestedRemedy

Add text that permits alternate connections/connectors can be used in the application environment, that the compliance requirements (like other Ethernet PHYs) are specified and tested at the mating surface of the specified MDI connector.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
IEEE Std 802.3 specifies compliant Ethernet ports at the MDI, but routinely does not specify the connectors used on test equipment or in test fixtures, and these may vary from vendor to vendor, test house to test house.
The specifications are made on the PHY port, which includes whatever MDI connector is used on the equipment under test. Permitting an alternate connector for testing, to unify the test equipment, would enable a situation where the device under test would no longer constitute a complete Ethernet port as intended for use, and therefore potentially invalidate the test results for the Ethernet port as intended for the application.

Cl **147** *SC* **147.9.1** *P* **200** *L* **24** # i-197

Maguire, Valerie — The Siemon Company

Comment Type **TR** *Comment Status* **D** *MDI*

The P802.3cg example text is no longer aligned with the TIA and ISO/IEC single-pair interface recommendations. Specifically, TIA and ISO/IEC recommended different connectors for different MICE environments. The results of the TIA and ISO/IEC evaluation would likely have been different (perhaps, even limited to one connector style) if it was agreed that operation across MICE1 to MICE3 was desired. As a result, there is no longer a basis for selecting these two connectors as the examples.

P802.3cg is close to publication and some of the example products are not commercially available.

SuggestedRemedy

On page 200, line 24: Replace, "Specific systems or applications can use connectors or terminals, in addition to those listed below, that support the link segment specification defined in 147.7 or the mixing segment specification defined in 147.8." with, "Specific systems or applications can use connectors or terminals that support the link segment specification defined in 147.7 or the mixing segment specification defined in 147.8.

Delete lines 26-34 on page 200.

Delete Figure 147-21, Figure 147-22, and Figure 147-23 on page 201.

Delete Figure 147-24, Figure 147-25, Figure 147-26, and Table 147-3 on page 202.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
The TIA and ISO/IEC recommendations specify connectors used to connect sections of cable in the link segment (i.e., between the two MDIs). The may make different choices than the IEEE 802.3cg draft makes for the connector at the MDI.
The IEEE 802.3cg should liaise the latest draft to TIA TR42 and ISO/IEC SC25 WG3 specifically pointing out the connector language so that those groups may choose whether to amend their specifications or respond (e.g., via liaison) otherwise.

Cl **147** *SC* **147.8.2** *P* **200** *L* **52** # i-403

Kim, Yongbum — NIO

Comment Type **TR** *Comment Status* **D** *Mixing Segment*

The mixing segment shall meet the return loss characteristics specified for link segments in 147.7.2
between any two MDI attachment points. And from 147.8 "A mixing segment is specified based on cabling that supports up to at least 8 nodes and 25 m in reach". From both of this statement, this specification is requiring 28 (combination of any two) measurement taken. And any added nodes requires all combinations to be measured again, and with no assurances that the prior conformant MDI may fall out of range.

SuggestedRemedy

Provide better medium specifcation and cable design considerations that can be followed assured scaleable MDI and medium construction.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter.
Further, the CRG disagrees with the commenter, as the commenter mistakes 147.8 explanatory text with the specification ("is specified" vs. "shall meet.").
It is common practice for cabling systems to be specified to be compliant by design rather than necessarily measured for each instance. Further, the characteristics required have been specified based on measurements indicating that they support the described topologies, an existence proof that design is feasible.

Cl **147** *SC* **147.9.2** *P* **203** *L* **17** # i-140

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

"." at the end of the line is too much (all other similar expressions in the draft D3.0 do not have a ".")

SuggestedRemedy

Remove "." at the end of the line.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.9.2** *P* **203** *L* **32** # i-1

Huszak, Gergely Kone

Comment Type **E** *Comment Status* **D** *EZ*

Format of the "NOTE-" paragraph is incorrect

SuggestedRemedy

Use the appropriate paragraph style for "NOTE-" paragraphs.
Consider scrubbing through the whole draft, to make sure all clauses are aligned with this: e.g. 147.3.2.7 and c146, including the annexes are good candidates for such checks

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.9.3** *P* **203** *L* **36** # i-262

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *MDI*

The phrasing of this clause and the next one make it appear that this is a requirement for testing the wiring rather than as a test access point for testing the DTE. Further, the test limit for a withstand voltage has absolutely zero margin with respect to PoDL which is contrary to usual practice for withstand voltage requirements. Additionally, consideration should be given to the possibility of there being other voltages in a sheath shared with this instance of 10BASE-T1L such as PoE.

SuggestedRemedy

Change the text to make it clearer that this test is a test of the DTE as tested from the MDI. Raise the test limit to be more appropriate with traditional withstand limits (ref e.g. cl. 14, 10BASE-T) and real world requirements such as static discharge.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Commenter is incorrect in suggesting this requirement be raised to align with static discharge. It is a tolerance to a continuous DC power voltage, not a transient, limited-energy static discharge. That test has zero margin with respect to Clause 104 (PoDL), which has a maximum current of 1.360 A. Note that in low voltage systems such as these, current margin is the relevant parameter, not voltage.
The remainder of the comment (aligning with the wire pair) is accommodated by i-44, which is as follows:
>>>>
Change this (at 203/38-39):
====
The wire pair of the MDI shall withstand without damage the application of positive voltages of up to 60 V DC with the source current limited to 2000 mA, under all operating conditions indefinitely.
====
to this:
====
The device shall withstand without damage the application of any voltages between 0 and 60 V DC with the source current limited to 2000 mA, applied across BI_DA+ and BI_DA<en-dash>, in either polarity, under all operating conditions, for an indefinite period of time.
====
<<<<

Cl **147** *SC* **147.9.3** *P* **203** *L* **38** # i-44

Yseboodt, Lennart Signify

Comment Type **TR** *Comment Status* **D** *MDI*

* Similar comment filed against Clause 146. Make sure to make changes consistently.

147.9.3:
"The wire pair of the MDI shall withstand without damage the application of positive voltages of up to 60 V dc with the source current limited to 2000 mA, under all operating conditions, for an indefinite period of time."

147.9.4:
"The wire pair of the MDI shall withstand without damage the application of short circuits of any wire to the other wire of the same pair or ground potential, as per Table 147-5, under all operating conditions, for an indefinite period of time."

- Why does 147.9.3 only cover positive voltages ?
- ... and 147.9.4 covers both polarities ?
- why is the subject of the sentence 'the wire pair of the MDI' when it should be the device itself ?

SuggestedRemedy

Change the quoted text in 146.9.3 to read:
"The device shall withstand without damage the application of any voltages between 0 V dc and 60 V dc with the source current limited to 2000 mA, applied across BI_DA+ and BI_DA-, in either polarity, under all operating conditions, for an indefinite period of time."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change this (at 203/38-39):
====
The wire pair of the MDI shall withstand without damage the application of positive voltages of up to 60 V DC with the source current limited to 2000 mA, under all operating conditions indefinitely.
====
to this:
====
The device shall withstand without damage the application of any voltages between 0 and 60 V DC with the source current limited to 2000 mA, applied across BI_DA+ and BI_DA<en-dash>, in either polarity, under all operating conditions, for an indefinite period of time.
====

Cl **147** *SC* **147.10.2** *P* **204** *L* **32** # i-141

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

... according to any applicable local, state or national standards ... (add serial comma)

SuggestedRemedy

... according to any applicable local, state, or national standards ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **147** *SC* **147.11** *P* **205** *L* **18** # i-45

Baggett, Tim Microchip Technology, Inc.

Comment Type **E** *Comment Status* **D** *Delay*

*** Comment submitted with the file 100559000003-Comment_8023cg_D3p0_Table_147-6_Typo_Errors.pdf attached ***

There are typographical (copy/paste?) errors in Table 147-6 10BASE-T1S Delay Constraints.

SuggestedRemedy

Change the "event" in Row 6 (Lines 43-45) from:
"COL input to CRS asserted"
to:
"MDI input to COL asserted"

==
Change the "Output timing reference" in Row 6 (Lines 43-45) from:
"Rising edge of CRS"
To:
"Rising edge of COL"

==
Change the "event" in Row 7 (Lines 46-47) from:
"COL input to CRS deasserted"
to:
"MDI input to COL deasserted"

==
Change the "Output timing reference" in Row 7 (Lines 46-47) from:
"Rising edge of CRS"
To:
"Rising edge of COL"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148** *P* **214** *L* **1** # i-393

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA_SCOPE*

[CSD] CSD/Economic Feasibility statements in CSD document is not valid for CL148 PLCA operation.
The project CSD states that "
The cost factors for Ethernet components and systems are well known. The proposed project may introduce new cost factors which can be quantified.
-The reduction in the number of legacy networks requiring specialized components, expertise, and gateways in the targeted markets is anticipated to result in a significant drop in both installation and operational costs."
While the cost factors for Ethernet is well known, this project introduces the new requirements that has not been a part of Ethernet. This project requires each node to be assigned a unique and sequential (as in little to no gaps in number sequence) node identifier to be assigned to each PHY, and allocate and assigna a special node identifier value of zero to a 'master node' that is responsible for sending special 'beacon' frame. This project requires that the configuration is assured (outside of this draft standard) that node identifier of zero is present, and only one of such node identifier is present. This operation described in this project cannot reasonably assume that this new behavior requirement could inherit "well known Ethernet cost factors". Also this project cannot reasonably assert assert "drop in both installation and operational costs" when addtional configuration of node assignment and behaviors are required and without any specification on how they are done.
CSD/Economic Feasibility with regard to other clauses, other than CL148, are not in question.

SuggestedRemedy

CSD/Economic Feasibility with regard to CL148 PLCA operation is no longer valid and grossly incorrect. Appropriate changes to the CSD/Economic Feasibility to be made and to be approved.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter improperly refers to CSDs which are not in scope for a Standards Association Ballot.

Additionally, commenter is incorrect. A number of individuals with a broad spectrum of affiliations agreed on an objective for this. The Criteria for Standards Development (e.g., broad market potential) apply to the entire standard:
====
Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:
a) Broad sets of applicability.
B) Multiple vendors and numerous users.
====

The existing 802.3cg broad market potential speaks to 10 Mb/s single-pair Ethernet in industrial, automotive, and intra-system applications, and the number and breadth of individuals and companies which have expressed interest in the standard.

Furthermore the commenter is technically incorrect in his assertions:
[1] PLCA node IDs do not need to be sequential
[2] There is no such description of master node in the draft
[3] The BEACON is not a frame, it is a 20 bit long signal on the line which carries no information apart from its own presence. It isconceptually not different from IDLE signals which most physical layers use to retrieve clocking informatio from.

Cl **148** *SC* **148** *P* **214** *L* **1** # i-47

Grow, Robert RMG Con

Comment Type **TR** *Comment Status* **D** *PLCA_SCOPE*

The PLCA protocol is a MAC protocol. It is virtually identical to a token bus protocol (shared medium) I specified years ago. This clause violates 802.3 layering, and though considerable effort has been made to place this in the Reconciliation Sublayer, it doesn't change the fact that the functions are medium access control.

SuggestedRemedy

Delete Clause 148 and related text.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The CRG disagrees with the commenter that PLCA is a MAC protocol.

Several evidence has been provided, and a tutorial has been given, to prove that PLCA is in fact a normal physical layer function.
See http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf

The fundamental reason for PLCA to be a physical layer function is that it only works in conjunction with the CSMA/CD MAC specified in Clause 4 (without any modification to Clause 4 itself).
PLCA provides carrierSense and collision detection information to the MAC by the means of the existing PLS_CARRIER.indication and PLS_SIGNAL.indication primitives which is what the Reconciliation Sublayer (which is part of the physical layer) is supposed to accomplish.

The commenter's statement "it doesn't change the fact that the functions are medium access control" righfully deserves an appropriate answer, which is more conceptual rather than purely technical.

The PLCA working principle is to detect collisions (concurrent transmission of multiple stations on a shared network segment) in a logical sense. As an example, 10BASE-2 and 10BASE-5 detect concurrent transmissions by checking the DC voltage level on the shared media, that is detecting the superposition of multiple (not decodable) signals on the line. PLCA detects the very same concurrent transmissions by aligning the data conveyed by the local MAC to the unique transmit opportunity of the node and checking for concurrent reception of a packet. In such a way the collision does not result in "corrupting" the signal on the media. That is, the packet currently being transmitted is not interrupted, thus yielding the advertised network performance enhancement.

This is also in line with the ISO/OSI principle by which a layer may enhance the service it provides to the upper layer.
See http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf

Moreover the commenter is unclear as PLCA + CSMA/CD is obviously not identical to 802.4 Token Bus, and it is unclear what specification the commenter is referring to. For example, PLCA does not define any handshake protocol between nodes, it does not generate packets and there is no concept of arbitration of the media. Additionally, CSMA/CD nodes with PLCA enabled interoperate properly with non-PLCA enabled nodes on the same network segment (without yielding the advertised gain in performance in this case). That would not be possible if nodes with PLCA enabled were not, in fact, using the CSMA/CD MAC protocol. See http://www.ieee802.org/3/cg/public/Sept2018/beruto_3cg_mixing_PLCA_with_non_PLCA_enabled_nodes_r1.2.pdf.

Cl **148** *SC* **148** *P* **214** *L* **1** # i-48

Grow, Robert RMG Con

Comment Type **GR** *Comment Status* **D** *PLCA_SCOPE*

This clause specifies functionality that is outside the scope of the PAR. The result of out of scope content is that all interested parties may not have been aware of actual content and as a result enticed to join the ballot group.

SuggestedRemedy

Either delete the clause and related content, or revise the PAR, reform the ballot group, and restart Standards Association ballot.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The commenter does not state the reasons that led him to this conclusion. Looking at a similar comment from the same commenter (i-47), the editor assumes he is referring to the incorrect assumption that PLCA is a new MAC.
Response to comment i-47 is:
PROPOSED REJECT.
The CRG disagrees with the commenter that PLCA is a MAC protocol.

Several evidence has been provided, and a tutorial has been given, to prove that PLCA is in fact a normal physical layer function.
See http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf

The fundamental reason for PLCA to be a physical layer function is that it only works in conjunction with the CSMA/CD MAC specified in Clause 4 (without any modification to Clause 4 itself).
PLCA provides carrierSense and collision detection information to the MAC by the means of the existing PLS_CARRIER.indication and PLS_SIGNAL.indication primitives which is what the Reconciliation Sublayer (which is part of the physical layer) is supposed to accomplish.

The commenter's statement "it doesn't change the fact that the functions are medium access control" righfully deserves an appropriate answer, which is more conceptual rather than purely technical.

The PLCA working principle is to detect collisions (concurrent transmission of multiple stations on a shared network segment) in a logical sense. As an example, 10BASE-2 and 10BASE-5 detect concurrent transmissions by checking the DC voltage level on the shared media, that is detecting the superposition of multiple (not decodable) signals on the line. PLCA detects the very same concurrent transmissions by aligning the data conveyed by the local MAC to the unique transmit opportunity of the node and checking for concurrent reception of a packet. In such a way the collision does not result in "corrupting" the signal on the media. That is, the packet currently being transmitted is not interrupted, thus yielding the advertised network performance enhancement.

This is also in line with the ISO/OSI principle by which a layer may enhance the service it provides to the upper layer.

See http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf

Moreover the commenter is unclear as PLCA + CSMA/CD is obviously not identical to 802.4 Token Bus, and it is unclear what specification the commenter is referring to. For example, PLCA does not define any handshake protocol between nodes, it does not generate packets and there is no concept of arbitration of the media. Additionally, CSMA/CD nodes with PLCA enabled interoperate properly with non-PLCA enabled nodes on the same network segment (without yielding the advertised gain in performance in this case). That would not be possible if nodes with PLCA enabled were not, in fact, using the CSMA/CD MAC protocol. See http://www.ieee802.org/3/cg/public/Sept2018/beruto_3cg_mixing_PLCA_with_non_PLCA_enabled_nodes_r1.2.pdf.

Cl **148** *SC* **148** *P* **214** *L* **1** # i-390

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA_SCOPE*

[PAR] PLCA Reconsciliation Sublayer (RS) contain specifications that handles contention avoidance and collision handling as well as access control. Media Access Control (MAC) specification is not a part of this Physical Layer project, as stated in this PAR scope: "5.2.b. Changes in scope of the project: Specify additions to and appropriate modifications of IEEE Std 802.3 to add 10 Mb/s Physical Layer (PHY) specifications and management parameters for operation, and associated optional provision of power, using a single balanced pair of conductors.", whereas the MAC definition is in CL 4.1.1 of IEEE 802.3-2018 states:
"...The MAC sublayer defines a medium-independent facility...b) Media Access Management
1) Medium allocation (collision avoidance)
2) Contention resolution (collision handling).."

Furthermore, Reconsilliation Sublayer, as defined in the same parent document IEEE 802.3-2018, in 1.4.425 states "1.4.425 Reconciliation Sublayer (RS): A mapping function that reconciles the signals at the Media Independent Interface (MII) to the Media Access Control (MAC)-Physical Signaling Sublayer (PLS) service definitions. (See IEEE Std802.3, Clause 22.)". PLCA RS claims to be an RS, but does NOT simply map PLS to MII, but performs 1) Medium allocation (collision avoidance) -- as the title says ("physical layer Collision Avoidance), 2) Contention resolution (collision handling). PLCA performs Medium Access control function (MAC).

SuggestedRemedy

Align this draft to the approved PAR (14-May-2018)by deleting CL148 in its entirety (pages 214 through 234, inclusive) and any changes associated with such deletion. Alternatively, submit a new PAR that substantialy reflect this project content, including a MAC specification in the scope, and provide approved PAR with such revised scope. If a new PAR is submitted with MAC specification in scope, then re-open and seek technical contributions with regards to the new scope.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter incorrectly posits that the Clause 148 PLCA RS is a new MAC. It does not meet the requirements for a MAC, and, leaves the MAC functionality with Clause 4, which, in fact, it could not work without. Commenter incompletely quotes IEEE Std 802-2014 4.1, paragraph 6 leading to incorrect conclusions.
See www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf.
See also http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf

Cl **148** *SC* **148.1** *P* **214** *L* **11** # i-263

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *Editorial*

It appears that the new text from the last round of changes is just laid on top as a note and did not actually get integrated into the text.

SuggestedRemedy

Change para. 3 to read: "PLCA is designed to work in conjunction with CSMA/CD and can be dynamically enabled or disabled via management interface. The use of this clause in any other context is beyond the scope of this standard." and remove the floating text.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The editor could not find a reference to the note cited by the commenter, nor a WGB comment that reports the cited changes.
The commenter might be reading a modified copy of the draft.

Cl **148** *SC* **148.1** *P* **214** *L* **12** # i-265

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *PLCA_SCOPE*

The first sentence refers to PLCA as though it is already a familiar, well understood and well specified protocol that is familiar to the reader by the time he gets to clause 148 of IEEE Std. 802.3. Such is hardly the case.

SuggestedRemedy

Add the following text to the last paragraph: "PLCA modifies the CSMA/CD shared media access method so that assured access is provided via the collision free round robin protocol specified in this clause." This is a necessary but not sufficient addition. We'll leave further detail requirements to later in the clause..

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change "This clause specifies the optional Physical Layer Collision Avoidance (PLCA) capabilities.
PLCA is defined for half-duplex mode of operation only. The PLCA RS is specified for operation with the
PHY defined in Clause 147 (10BASE-T1S).
PLCA is designed to work in conjunction with CSMA/CD and can be dynamically enabled or disabled via
management interface."

to

"This clause specifies a reconciliation sublayer to provide optional Physical Layer Collision Avoidance (PLCA) capabilities. The PLCA RS is specified for operation with Clause 147 (10BASE-T1S) PHYs operating in half-duplex multidrop mode. When used as a reconcilation sublayer, it aligns data from the MAC with transmission opportunities of the physical layer and maps the physical layer signals to PLS primitives towards the MAC. The use of PLCA-enabled physical layers in CSMA/CD half-duplex shared-medium networks provides enhanced performance relative to CSMA/CD without PLCA by avoiding corruption of signals on the media itself. PLCA-enabled nodes can coexist with nodes without PLCA enabled on the same mixing segment, all using 802.3 CSMA/CD."

Cl **148** *SC* **148.4.6** *P* **214** *L* **22** # i-418

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **D** *PLCA_SCOPE*

[CSD/Compatibility] [Installed base compatibility] [PAR -- scope did not include MAC function in the project scope]
In PLCA data state diagram, COLLIDE state and related functional behaviors create a condition where in half-duplex, CSMA/CD, MAC transmits a packet, into a substantially busy network, but the collision condition does not result in a collision on the shared media. The collision signal is asserted only for the local node for the TX to collide-&-retry, while the simultaneous received signal that caused the collision is expected to be received as if there is no collision. The remote transmiter is not notified of contention on the network. This is a new behavior for an half-duplex MAC.

Legacy and installed base of Ethernet MACs expect to operate in 'architecturally' separate TX and RX, i.e. full-duplex datapath, while in half-duplex mode. Explicit allowance for implementations to optimize the datapath resources to only support simplex datapath operation is found in 4.1.2 where only obvious externally testable condition was inserted into the CL4 spec:

"4.1.2 CSMA/CD operation. ..... Transmit frame operations are independent from the receive frame operations. A transmitted frame addressed to the originating station will be received and passed to the MAC client at that station. This characteristic of the MAC sublayer may be implemented by functionality within the MAC sublayer or full duplex characteristics of portions of the lower layers."

And the clear architectural model vs implementations here in 1.1.3.1: "...The architectural model is based on a set of interfaces that may be different from those emphasized in implementations. One critical aspect of the design, however, shall be addressed largely in terms of the implementation interfaces: compatibility."

This new behavior specified in CL148 PLCA data state diagram is not compatible with many installed bases of 802.3 nodes with appropriate explosed MII interoperability test point that is also a phyical interface with specified connectors. Also as forementioned, the contention management and collision handling are MAC functions, not a part of Physical Layer that Reconsiiation Sub-layer belongs to.

Additional info could be found here : (slides 14~18 of):
http://www.ieee802.org/3/cg/public/Nov2018/Kim_3cg_01a_1118.pdf

SuggestedRemedy

This clause CL148 PLCA RS should be deleted. Alternatively re-architected to avoid introducing new normative behaviors to the installed base with exposed interoperability interfaces.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter fails to show compatibility issues with conformant implementations and incorrectly posits PLCA is a new MAC.

See http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf

Cl **148** *SC* **148.2** *P* **214** *L* **38** # i-419

Seaman, Michael MICK SEAMAN

Comment Type **G** *Comment Status* **D** *PLCA_PRIORITIES*

The utility of PLCA would be considerably improved, and emerging application areas (e.g. industrial, automotive) if the BEACON mechanisms provided simple support for priority. Two priority levels would be sufficient to support a deterministic (known bounded latency) service in addition to best effort. Four priority levels may be desirable, though I would not advocate more without detail uses case analysis.

SuggestedRemedy

Specify the BEACON to allow inclusion of a priority indication as a follow on project if not part of the present effort.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Big Ticket Item - PLCA_PRIORITIES.

Communication of 802.1 priorities to the physical layer in an 802.3 PHY would require modification of the 802.3 MAC Service Access Point definition, and hence the MAC layer. While potentially desirable, this would be outside the scope of a physical layer project and the approved PAR.

Cl **148** *SC* **148.2** *P* **214** *L* **41** # i-7

Hajduczenia, Marek Charter Communications

Comment Type **E** *Comment Status* **D** *PLCA_ID*

We typically avoid the use of "must" except for the use cases specidified in Style Manual - this is not the case.

SuggestedRemedy

Change "node ID must be" to "node ID shall be" and add PICS entry for it

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The node ID is a configuration parameter set by the management entity which cannot generate a PICS entry by definition.
The cited sentence is descriptive text meant to help the reader understanding the working principle of PLCA. It also helps the user to properly set the PLCA configuration parameters.

Cl **148** *SC* **148.2** *P* **214** *L* **42** # i-268

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA_ID*

This lack of a complete specification for full functionality is completely unprecedented for 10 Mb/s Ethernet and a major shortcoming. Plug and work, historically, has been a major factor in the success of Ethernet in face of the competition (which usually required a bunch of configuration before it would go on-line). Two examples of this in the history of Ethernet come to mind: (1) In the early days of 10 Mb/s full duplex and 100BASE-T early implementations of AutoNegotiation did not work very well. The failure of the promised plug 'n' play was a major marketing issue. (2) In the very first (3 Mb/s) version of Ethernet, DTEs only had 8 bit addresses. They had to have their addresses manually configured with push-on test leads as part of their installation process. This made the customer (most of whom were EEs or Computer Scientists) installation not possible and a technician had to be involved. Major network management problem.

SuggestedRemedy

Come up with and require availability of an automatic configuration app. No reason one shouldn't be able to use the CSMA/CD capability to (1) identify the stations on the local segment and (2) hand out the unique assigned node ID to each DTE.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter provides insufficient information for a sufficient response.
Defining an "automatic configuration app" may be a desirable feature, but appears to involve higher layer protocols and algorithms for configuration of the specified management parameters, which the CRG believes would be outside the scope of the

Cl **148** *SC* **148.2** *P* **214** *L* **42** # i-269

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *PLCA_ID*

There needs to be a little more discussion of local_ID assignment, how it doesn't appear externally and that it is fully contained within the segment.

SuggestedRemedy

Add the following text at the end of the first paragraph: The local_ID assignment value doesn't appear externally or in the payload packet format. The local_ID assignment value is fully contained within the local bussed segment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add the following text at the end of the first paragraph at line 43: The node ID assignment value does not appear externally or in the payload packet format. The node ID assignment value is fully contained within the local collision domain.

Cl **148** *SC* **148.2** *P* **214** *L* **44** # i-397

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **X** *PLCA_ID*

[CSD/Compatibility + PAR] CL148 PLCA RS does not specify how a node is selected for NodeID=0, how other NodeIDs are assigned, how an end-station is aware of other end-stations configuration enough to configure itself to operate, etc, such that two implementations connected via a referenced network segment is not assured to work. This indicates grossly incomplete specification.

SuggestedRemedy

Complete CL148 specification by including additional currently-missing specifications on how all parameters necessary to assure interoperability is achieved via non-vendor-denpendant protocols. Since this is a concern WRT to missing specification, the suggested remedy is not included (i.e. filling in the missing specification is the scope of the IEEE 802.3cg project).

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Description or requirements of assignment of parameters in the management entity is beyond the scope of this standard.

This is clearly stated in 148.2: "Other than the condition that the assigned node ID must be unique to the local collision domain, the method of determination of the node ID and to_timer by the management entity is beyond the scope of this standard."

Additionally, commenter is incorrect. End stations on mis-configured networks or networks where not all the nodes are configured for PLCA operation will operate, allowing configuration to be set by management for improved performance. See http://www.ieee802.org/3/cg/public/Sept2018/beruto_3cg_mixing_PLCA_with_non_PLCA_enabled_nodes_r1.2.pdf

Cl **148** *SC* **148.2** *P* **214** *L* **44** # i-396

Kim, Yongbum NIO

Comment Type **TR** *Comment Status* **X** *PLCA_ID*

[CSD] PLCA RS requires 1) each node/PHY to be configured with a nodeID, 2) entire network node/PHY configuration to be coordinated, i.e. unique and nearly sequential nodeID values, unique node with nodeID=0, etc 3) provides no protocol with which #2 could be accomplished, i.e. no interoperable protocol to achieve these requyirements, 4) provides no remedy for boundry conditions such as multiple nodeID=0, no node with nodeID=0, non-unique nodeID in a network, unconfigured node in a configured network, etc, 5) provides no protocol that may discover any of these issues.

CSD/Compatibility means that two or more complaint implementations would interoperate with a high degree of probablity. This is one of the main reasons most standards to exist -- assured and certain interoperability.

PLCA RS in CL148 does not meet this CSD requirements, nor its asserted claim in its CSD response.

SuggestedRemedy

CSD/Compatibilty assertions with regard to CL148 PLCA operation is grossly incorrect. Appropriate changes to the CSD/Compatibility with regards to PLCA's inability to assure two compliant implementations interoperate without further engineering, design, and configuration be addressed, OR add appropriate specifcations to remedy the concerns WRT interoperability and completeness of specification that assure interoperability, OR delete CL148 PLCA from this draft (and re-start the project development with completeness as a required scope, if desired.)

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Commenter improperly refers to CSDs which are not in scope for a Standards Association Ballot.

Besides, the commenter is technically incorrect in his assertions:
[1] PLCA node IDs do not need to be sequential
[2] the definition of a protocol for assigning node IDs would be out of the scope of this project and the approved PAR.
[3] PLCA is an optional feature that still operates under misconfiguration. See http://www.ieee802.org/3/cg/public/Sept2018/beruto_3cg_mixing_PLCA_with_non_PLCA_enabled_nodes_r1.2.pdf

Cl **148** *SC* **148.3** *P* **215** *L* **5** # i-270

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **X** *PLCA_SCOPE*

The "Relationship with other IEEE standards" is incorrect with respect to the ISO Layer Model, 802 tradition and precedent and previous 802.3 projects that fiddled with shared media access methods[1]. When 802 did its adaptation of the ISO 7 Layer Model it subdivided the Data Link Layer into the LLC Sublayer and the MAC Sublayer specifically so that there was a separate place in the overall 802 model that "performs access control functions for the shared medium in support of the (common) LLC Sublayer[2]". Properly placed, PLCA would conform to this model, or (more properly) PLCA and CSMA/CD together would supply a complete MAC Sublayer for PLCA operation that would have a "Distinct Identity" that is different from CSMA/CD - Ethernet. To make things fit into the desired product implementation for fitting to existing IP the new PLCA block could have both a top MII to interface to existing designs and a bottom MII to attach to the PHY in the conventional manner. [1] Clause 64, Clause 99 [2] IEEE Std 802-1990 Overview & Architecture

SuggestedRemedy

Remove the entire PLCA clause (148) and associated textual material plus references from the draft. This will eliminate any scope issues and bring the draft into fully into line with the letter and expectations of the project paperwork at all levels (i.e. PAR, CSD, 802.3 project Objectives) [Further, thoughts not needed to resolve my required comment. I would fully support the creation of a new project to take place either within 802.3 or in a new 802 Working Group to standardize what we now call PLCA as a MAC sublayer element where the other required elements for a full DTE standard are provided by reference to the relevant portions of the 802.3 standard, as appropriate.]

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The CRG disagrees with the commenter's description of layering and the proper placement of PLCA in the layering model. PLCA performs the functions delegated by the 802.3 layer model to the physical layer - carrier sense and collision detection. Commenter seems to posit an implementation which is not described in the amendment, where the PLCA sublayer interfaces to the MAC via an MII. (a "top MII" per the commenter), whereas PLCA maintains the layering and communicates to the MAC via the primitives PLS_CARRIER and PLS_SIGNAL defined in IEEE Std 802.3, and communicates with the remainder of the physical layer through the MII interface. For more detail on how PLCA relates to OSI layering please see http://www.ieee802.org/3/cg/public/adhoc/brandt_020619_3cg_01a_adhoc.pdf.
Additionally, the fact that PLCA-enabled half-duplex CSMA/CD stations may operate with and coexist with non-PLCA enabled half-duplex CSMA/CD stations on the same mixing segment is evidence that PLCA is an physical-layer augmentation to the CSMA/CD half-duplex MAC and not a new MAC function in itself. See http://www.ieee802.org/3/cg/public/Jan2019/Tutorial_cg_0119_final.pdf and http://www.ieee802.org/3/cg/public/Sept2018/beruto_3cg_mixing_PLCA_with_non_PLCA_enabled_nodes_r1.2.pdf

Cl **148** *SC* **148.4.2** *P* **215** *L* **49** # i-198

Koczwara, Wojciech Rockwell Automation

Comment Type **T** *Comment Status* **D** *PLCA_LIMITS*

*** Comment submitted with the file 100622500003-Koczwara_3cg_PLCA_improvement_for_high_node_count_v1p6.pdf attached ***

Variable delay line in PLCA RS can overrun slotTime, resulting in late collisions. See Koczwara_3cg_PLCA_improvement_for_high_node_count_v1p6.pdf slides 4-8 for more detail.

SuggestedRemedy

Specify the delay in the PLCA RS to less than 496 bit times (to avoid late collisions) and use carrier-sense to avoid buffer overflow. See Koczwara_3cg_PLCA_improvement_for_high_node_count_v1p6.pdf slides 10-23 for detailed text and state diagram changes.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accommodated by i-425.

Proposed resolution of comment i-425 is:
PROPOSED ACCEPT IN PRINCIPLE.
The CRG agrees with the commenter that the PLCA delay line length needs further specification to avoid crossing the MAC late collision threshold. The proposed solution is to limit the variable delay line maximum length to one slotTime minus a margin. This margin is calculated in such a way to compensate for the MAC and the RS own delays.
Additionally, the PLCA DATA state diagrams need to handle the case where the delay line overflows by switching to the COLLIDE state to defer transmission until the next transmit opportunity.
For a detailed description of the issue and the proposed solution, see http://www.ieee802.org/3/cg/public/adhoc/Koczwara_3cg_Specifying%20PLCA%20delay%20and%20overflow%20behavior_v2p0.pdf

Implement the following text changes:

In Figure 148-4, apply the following changes:
[1] in the transition from the "HOLD" state to the "A" connector replace "recv_timer_done + receiving" with "recv_timer_done + receiving + a = delay_line_length"

[2] remove the transition arrow (and related condition) from the "COLLIDE" to the "PENDING" state.

[3] add a state named "DELAY_PENDING" between the "COLLIDE" and the "PENDING" state.

[4] In the action box of the "DELAY_PENDING" state, add "start_pending_timer" and

"SIGNAL_STATUS <= NO_SIGNAL_ERROR"

[5] Add a transition from the "COLLIDE" state to the "DELAY_PENDING" state with the following condition: "!plca_txen"

[6] Add a transition from the "DELAY_PENDING" state to the "PENDING" state with the following condition: "pending_timer_done"

[7] from the action box of the "PENDING" state, delete "CARRIER_STATUS <= CARRIER_ON" and "SIGNAL_STATUS <= NO_SIGNAL_ERROR"

Grant editorial license to re-draw Figure 148-4 according to IEEE 802.3 style

From 148.4.6.1 at page 225, line 33, remove "The variable delay line length is no greater than to_timer × plca_node_count + beacon_timer."

At page 225, line 45 change " switching to
PENDING state." to " switching to
DELAY_PENDING state. The PLCA Data State Diagram switches to the PENDING state after waiting for the pending_timer. The pending_timer is used to prevent committing to a transmit opportunity before transmit data is available. This prevents conveying unwanted long COMMIT requests to the PHY."

Append the following text to 148.4.6.4 Timers:
"pending_timer
Defines the time the PLCA Data State Diagram waits in the
DELAY_PENDING state before switching to PENDING state.
Duration: 512 bit times.
Tolerance: +/- 1/2 bit time."

Add subclause 148.4.6.5 Constants
"delay_line_length
This constant is implementation dependent and specifies the maximum length of the PLCA RS variable delay line depicted in figure 148-2.
Value: up to 480 bit times"

Append the following text to 148.4.3.1.2 Semantic of the service primitive:
"The mapping of this primitive to the plca_txen and plca_txd variables shall be accomplished in less than or equal to 8 bit times."

Cl **148** *SC* **148.4.4** *P* **218** *L* **17** # i-372

Law, David — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *Editorial*

Clause 148, which specifies the PLCA Reconciliation Sublayer (RS), cannot place requirement (shall statements) on the connected PHY. Subclause 1.1.3.2 'Compatibility interfaces' of IEEE Std 802.3-2018 defines the MII as a compatibility interface. As such an implementer is permitted to implement only the Clause 148 RS, however having shall statements related to the PHY results in requirements that this RS implementer will be unable to satisfy. This can be seen in the PICS where a Clause 148 RS implementer is required to respond to questions about the PHY such as PLCA2 and PLCA3 where the status is M and the support is Yes[]. In addition a PLCA RS supports PHYs other than 10BASE-TS1.

SuggestedRemedy

[1] Change 148.4.4 'Requirements for the PHY' to read 'In order to support Physical Layer Collision Avoidance the RS has to be connected to a 10BASE-TS1 PHY.
{2] Remove requirements on the PHY from Clause 148.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Implement proposed remedy [1].

At page 218, line 29, change "the PHY shall encode and transmit a signal" to "the PHY encodes and transmits a signal"

At page 218, line 44, change "Upon the reception of this request, the RX_DV signal shall not be asserted" to "Upon the reception of this request, the RX_DV signal is not asserted"

At page 219, line 3, change "When the PHY receives a BEACON, it shall indicate this information" to "When the PHY receives a BEACON, it indicates this information"

At page 219, line 11, change "When the PHY receives a COMMIT from the line, it shall indicate" to "When the PHY receives a COMMIT from the line, it indicates"

Delete the following PICS entries in 148.5.3.3: PLCA2, PLCA3, PLCA4, PLCA5, PLCA8.

Cl **148** *SC* **148.4.4.2** *P* **218** *L* **51** # i-142

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

PLCA specific (add "-")

SuggestedRemedy

PLCA-specific

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.1** *P* **219** *L* **25** # i-143

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

To achieve error free operation the PLCA node should be configured appropriately before transmit functions are enabled. (add comma after "appropriately")

SuggestedRemedy

To achieve error free operation the PLCA node should be configured appropriately, before transmit functions are enabled.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
Wording looks correct

Cl **148** *SC* **148.4.5.1** *P* **219** *L* **28** # i-144

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

b) there is one and only one node with local_nodeID = 0 on the local collision domain, (redundant wording)

SuggestedRemedy

b) there is only one node with local_nodeID = 0 on the local collision domain,

Proposed Response *Response Status* **W**

PROPOSED REJECT.
"one and only one" is logically different from "only one". It means that you need to have one, and no more than one. If you just say "only one", you are not saying that you need exactly one, which is the intended meaning here.

Cl **148** *SC* **148.4.5.1** *P* **219** *L* **35** # i-428

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *Editorial*

The text calls for things to be reset to the defaults shown in the figure. There are no defaults shown in the figure.

SuggestedRemedy

Point instead to subclause 148.4.5.2 where the items are defined and add the default values there,

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Delete "When PLCA functions are disabled (plca_en = FALSE), the PLCA control variables are reset to their default
values as shown in Figure 148-3 and no special signaling is conveyed to the MII through the tx_cmd variable."

The intention was to describe what happens in Figure 148-3 / DISABLE state. Since the figure is self-explenatory the text is not needed.

Cl **148** *SC* **148.4.5.1** *P* **220** *L* **13** # i-145

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

CRS is asserted by the PHY through MII, indicating there's activity on the line. (avoid short forms)

SuggestedRemedy

CRS is asserted by the PHY through MII, indicating there is activity on the line.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.1** *P* **220** *L* **22** # i-146

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If condition (1) occurs, the node is about to receive either a valid packet, a COMMIT request, a BEACON request or it might just be receiving a false carrier event. (remove "just")

SuggestedRemedy

If condition (1) occurs, the node is about to receive either a valid packet, a COMMIT request, a BEACON request or it might be receiving a false carrier event.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.1** *P* **220** *L* **28** # i-186

Xu, Dayin — Rockwell Automation

Comment Type **E** *Comment Status* **D** *EZ*

Change "RECEIVE state is then enterer until ..." to "RECEIVE state is then kept until ..."

SuggestedRemedy

Change "RECEIVE state is then enterer until ..." to "RECEIVE state is then kept until ..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.1** *P* **220** *L* **45** # i-147

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

In this case the YIELD state is entered to just skip the TO, allowing other nodes a chance to transmit. (add comma after "case" and remove (redundant) "just")

SuggestedRemedy

In this case, the YIELD state is entered to skip the TO, allowing other nodes a chance to transmit.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.1** *P* **221** *L* **9** # i-373

Law, David — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *State Diagram*

There appears to be a conflict, or at least a lack of clarity, between the Figure 148-3 'PLCA Control state diagram' and the Figure 148-4 'PLCA DATA state diagram' in respect to which controls the encoding being placed on the MII transmit signals TXD, TX_EN and TX_ER by the PLCA RS.

As an example, when the PLCA Control state diagram is in the SEND_BEACON state, one of the actions is tx_cmd <= BEACON, which based on subclause 148.4.5.2 should result on the BEACON encoding defined in Table 22-1 being placed on TXD, TX_EN and TX_ER. At the same time that the PLCA Control state diagram is in the SEND_BEACON state, it would appear that the PLCA DATA state diagram is in the IDLE state, and the actions within the IDLE state include TXD <= 0000 and TX_EN <= FALSE. Hence we have the two different state diagrams requiring different values to be placed on TXD and TX_EN at the same time resulting in a conflict.

Perhaps the intent is to have both state diagrams assign values to TXD and TX_EN, but that isn't clear to me as one state diagram uses tx_cmd and the other TXD and TX_EN.

In addition, the states within the PLCA Control state diagram that have actions assigning values to tx_cmd, and therefore potentially changing the values of TXD and TX_EN, are not synchronised to TX_CLK through the MCD variable in that way that actions that assign values to TXD and TX_EN are in the 'PLCA DATA state diagram'. Not synchronising state changes in the PLCA Control state diagram change the value of tx_cmd could result in transitions in TXD and TX_EN that do not meet the timing requirements of IEEE Std 802.3-2018 subclause 22.3.1 'Signals that are synchronous to TX_CLK'.

Finally, it isn't clear to me why TX_ER would be an input to Figure 148-4 'PLCA DATA state diagram'. I was wondering if it was meant to be a plca_txer variable derived from the MAC service interface, similar to the plca_txen, but the MAC service interface doesn't provide the ability for the MAC to pass transmit errors to the RS.

One, I assume unintended, consequence of the use of TX_ER is that when the PLCA RS with local_nodeID=0 is transmitting a BEACON, and therefore TX_ER = 1 (see Table 22-1), and then a transmission from the local MAC is started, it would appear that this transmission is discarded. This is due to the PLCA DATA state diagram transitioning from the IDLE state to the HOLD state due to plca_txen, then to the ABORT state, which sets packetPending to FALSE discarding the packet, as a result of the transition condition (recv_timer_not_done * MCD * !committed * TX_ER * !receiving) being true.

SuggestedRemedy

[1] Clarify the source of TXD and TX_EN as either the Figure 148-3 'PLCA Control state diagram' or the Figure 148-4 'PLCA DATA state diagram'. If the intent is that both should source TXD and TX_EN, suggest that tx_cmd should be replaced with TXD, TX_EN and TX_ER in the respective PLCA Control state diagram states.

[2] Ensure that MCD is used in any condition that results in a change of value in TXD,

TX_EN or TX_ER in the PLCA Control state and PLCA DATA state diagrams.

[3] Clarify the use of TX_ER in the transition condition from the HOLD to the ABORT state in the PLCA DATA state diagram.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
At page 223, line 23 replace
"tx_cmd Command to be conveyed to the PHY via MII. When set to NONE, no special signaling shall be conveyed. When set to BEACON or COMMIT, respective commands shall be conveyed to MII as specified in 148.4.4.1.1 and 148.4.4.1.2.
Values: NONE, BEACON or COMMIT"

with:

"tx_cmd Command for the PLCA DATA State Diagram to convey to the PHY via the MII.
Values: NONE, BEACON or COMMIT"

At page 225, line 36, replace "TX_ER" with "plca_txer".

Apply the following changes, in this order exactly:
1. In figure 148-4 replace all occurrences of "TX_ER" with "plca_txer".
2. In figure 148-4, in the NORMAL state, add "TX_ER <= plca_txer"
3. In figure 148-4, in the IDLE state, add "TX_ER <= ENCODE_TXER(tx_cmd). Replace "TXD <= 0000" with "TXD <= ENCODE_TXD(tx_cmd)"
4. In figure 148-4, in the RECEIVE, PENDING and WAIT_MAC states, add "TX_ER <= ENCODE_TXER(tx_cmd). Add "TXD <= ENCODE_TXD(tx_cmd)"
5. In figure 148-4, in the HOLD, ABORT, TRANSMIT and FLUSH states, add "TX_ER <= plca_txer".
6. In figure 148-4, in the HOLD and ABORT states, add "TXD <= 0000".

At page 228, line 10, add:
"plca_txer the conditions for generating plca_txer are the same as defined in 22.2.1.6 and 22.2.2.5 for the TX_ER MII signal. Values: TRUE or FALSE"

Replace content of subclause 148.4.6.3 with the following text:
"ENCODE_TXER
This function takes as its argument the tx_cmd variable defined in 148.4.5.2.
It returns TRUE if tx_cmd is BEACON or COMMIT. Otherwise it returns the value of the plca_txer variable, defined in 148.4.6.2

ENCODE_TXD
This function takes as its argument the tx_cmd variable defined in 148.4.5.2.
If tx_cmd is BEACON, the return value is the TXD encoding defined in Table 22-1 for the BEACON request.
If tx_cmd is COMMIT, the return value is the TXD encoding defined in Table 22-1 for the COMMIT request.
Otherwise, the return value is 0000.
"

Replace content of subclause 148.4.3.6 with the following text:
"Generation of TX_ER shall comply with the PLCA Data State Diagram specified in 148.4.6.1"

Apply the following modifications to the PICS:
At page 232, line 39, replace "Specified in 22.2.1.6" with "Specified in "148.4.6.1"
At page 233, line 44, delete the CON3 line.

Cl **148** *SC* **148.4.5.2** *P* **223** *L* **25** # i-374

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Suggest that '... to the PHY via MII.' should be changed to read '... to the PHY via the MII.'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Superseded by resolution of i-373.

Proposed Resolution of comment i-373 is:
PROPOSED ACCEPT IN PRINCIPLE.
At page 223, line 23 replace
"tx_cmd Command to be conveyed to the PHY via MII. When set to NONE, no special signaling shall be conveyed. When set to BEACON or COMMIT, respective commands shall be conveyed to MII as specified in 148.4.4.1.1 and 148.4.4.1.2.
Values: NONE, BEACON or COMMIT"

with:

"tx_cmd Command for the PLCA DATA State Diagram to convey to the PHY via the MII.
Values: NONE, BEACON or COMMIT"

At page 225, line 36, replace "TX_ER" with "plca_txer".

Apply the following changes, in this order exactly:
1. In figure 148-4 replace all occurrences of "TX_ER" with "plca_txer".
2. In figure 148-4, in the NORMAL state, add "TX_ER <= plca_txer"
3. In figure 148-4, in the IDLE state, add "TX_ER <= ENCODE_TXER(tx_cmd). Replace "TXD <= 0000" with "TXD <= ENCODE_TXD(tx_cmd)"
4. In figure 148-4, in the RECEIVE, PENDING and WAIT_MAC states, add "TX_ER <= ENCODE_TXER(tx_cmd). Add "TXD <= ENCODE_TXD(tx_cmd)"
5. In figure 148-4, in the HOLD, ABORT, TRANSMIT and FLUSH states, add "TX_ER <= plca_txer".
6. In figure 148-4, in the HOLD and ABORT states, add "TXD <= 0000".

At page 228, line 10, add:
"plca_txer the conditions for generating plca_txer are the same as defined in 22.2.1.6 and 22.2.2.5 for the TX_ER MII signal. Values: TRUE or FALSE"

Replace content of subclause 148.4.6.3 with the following text:
"ENCODE_TXER
This function takes as its argument the tx_cmd variable defined in 148.4.5.2.
It returns TRUE if tx_cmd is BEACON or COMMIT. Otherwise it returns the value of the plca_txer variable, defined in 148.4.6.2

ENCODE_TXD
This function takes as its argument the tx_cmd variable defined in 148.4.5.2.
If tx_cmd is BEACON, the return value is the TXD encoding defined in Table 22-1 for the BEACON request.
If tx_cmd is COMMIT, the return value is the TXD encoding defined in Table 22-1 for the COMMIT request.
Otherwise, the return value is 0000.
"

Replace content of subclause 148.4.3.6 with the following text:
"Generation of TX_ER shall comply with the PLCA Data State Diagram specified in 148.4.6.1"

Apply the following modifications to the PICS:
At page 232, line 39, replace "Specified in 22.2.1.6" with "Specified in "148.4.6.1"
At page 233, line 44, delete the CON3 line.

Cl **148** *SC* **148.4.5.2** *P* **223** *L* **27** # i-148

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *Editorial*

NONE, BEACON or COMMIT (add serial comma after "BEACON")

SuggestedRemedy

NONE, BEACON, or COMMIT (please also add the comma to the identical text in line 32 on the same page)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Superseded by resolution of i-373.

Propopsed resolution of comment i-373 is:
PROPOSED ACCEPT IN PRINCIPLE.
At page 223, line 23 replace
"tx_cmd Command to be conveyed to the PHY via MII. When set to NONE, no special signaling shall be conveyed. When set to BEACON or COMMIT, respective commands shall be conveyed to MII as specified in 148.4.4.1.1 and 148.4.4.1.2.
Values: NONE, BEACON or COMMIT"

with:

"tx_cmd Command for the PLCA DATA State Diagram to convey to the PHY via the MII.
Values: NONE, BEACON or COMMIT"

At page 225, line 36, replace "TX_ER" with "plca_txer".

Apply the following changes, in this order exactly:
1. In figure 148-4 replace all occurrences of "TX_ER" with "plca_txer".
2. In figure 148-4, in the NORMAL state, add "TX_ER <= plca_txer"
3. In figure 148-4, in the IDLE state, add "TX_ER <= ENCODE_TXER(tx_cmd). Replace "TXD <= 0000" with "TXD <= ENCODE_TXD(tx_cmd)"
4. In figure 148-4, in the RECEIVE, PENDING and WAIT_MAC states, add "TX_ER <= ENCODE_TXER(tx_cmd). Add "TXD <= ENCODE_TXD(tx_cmd)"
5. In figure 148-4, in the HOLD, ABORT, TRANSMIT and FLUSH states, add "TX_ER <= plca_txer".
6. In figure 148-4, in the HOLD and ABORT states, add "TXD <= 0000".

At page 228, line 10, add:
"plca_txer the conditions for generating plca_txer are the same as defined in 22.2.1.6 and 22.2.2.5 for the TX_ER MII signal. Values: TRUE or FALSE"

Replace content of subclause 148.4.6.3 with the following text:
"ENCODE_TXER
This function takes as its argument the tx_cmd variable defined in 148.4.5.2.
It returns TRUE if tx_cmd is BEACON or COMMIT. Otherwise it returns the value of the plca_txer variable, defined in 148.4.6.2

ENCODE_TXD
This function takes as its argument the tx_cmd variable defined in 148.4.5.2.
If tx_cmd is BEACON, the return value is the TXD encoding defined in Table 22-1 for the BEACON request.
If tx_cmd is COMMIT, the return value is the TXD encoding defined in Table 22-1 for the COMMIT request.
Otherwise, the return value is 0000.
"

Replace content of subclause 148.4.3.6 with the following text:
"Generation of TX_ER shall comply with the PLCA Data State Diagram specified in 148.4.6.1"

Apply the following modifications to the PICS:
At page 232, line 39, replace "Specified in 22.2.1.6" with "Specified in "148.4.6.1"
At page 233, line 44, delete the CON3 line.

Cl **148** *SC* **148.4.5.2** *P* **223** *L* **28** # i-375

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

Suggest that rx_cmd should be defined in terms of the PLCA RS, which this Clause is specifying, rather than the PHY. In addition, suggest that there should be a reference to Table 22-2 encodings that rx_cmd is derived from.

SuggestedRemedy

rx_cmd
Encoding present on RXD<3:0>, RX_ER, and RX_DV as defined in Table 22-2.
Values:
NONE: PLCA BEACON or COMMIT indication encoding not present on RXD<3:0>, RX_ER, and RX_DV.
BEACON: PLCA BEACON indication encoding present on RXD<3:0>, RX_ER, and RX_DV.
COMMIT: PLCA COMMIT indication encoding present on RXD<3:0>, RX_ER, and RX_DV.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **32** # i-376

Law, David Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *Timers*

This subclause specifies the duration of the beacon_timer as 20 bit times. IEEE Std 802.3-2018 subclause 1.4.160 'bit time' states that 'The bit time is the reciprocal of the bit rate. For example, for 100BASE-T the bit time is 10-8 s or 10 ns.'. As a results in a duration of beacon_timer is exactly 20 x reciprocal(10 Mb/s) = 2000 ns. This would seem to result in a requirement for infinite precision and make a beacon_timer of 2000 + 10-15 ns non-conformant.

SuggestedRemedy

Provide a tolerance for the beacon_timer, burst_timer, commit_timer (subclause 148.4.6.4), hb_send_timer (subclause 147.3.7.1.2), hb_timer (subclause 147.3.7.1.2) and link_hold_timer (subclause 147.3.7.2.3)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
At page 224, line 32, append: "Tolerance: +/- 1/2 bit time"

At page 224, line 38, append: "Tolerance: +/- 1/2 bit time"

At page 224, line 52, append: "Tolerance: +/- 1/4 bit time"

At page 228, line 55, append: "Tolerance: +/- 1/2 bit time"

At page 186, line 16, append: "Tolerance: +/- 1/2 bit time"

At page 186, line 20, append: "Tolerance: +/- 100 us"

At page 189, line 35, append: "Tolerance: +/- 100 us"

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **34** # i-377

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

As there are other instances of an actual counter within Figure 148-3 'PLCA Control state diagram' such as bc (see page 222, line 34) suggest that burst_timer shouldn't be defined as 'Counts the time to wait ... in bit-times.'.

SuggestedRemedy

Suggest that the text 'Counts the time to wait for the MAC to send a new packet before yielding the transmit opportunity, in bit-times.' should be changed to read 'This timer determines how long to wait for the MAC to send a new packet before yielding the transmit opportunity.'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **38** # i-271

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Editorial*

It would be helpful to include the default value here

SuggestedRemedy

Add text: The default value specified in Clause 30 is 128.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add text: "The default value is specified in 30.3.9.2.7"

In the editor's opinion duplicating the text could make the maintenance more complicated in the future. A reference is usually better.

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **40** # i-378

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Suggest that 'This timer determines how much time to wait in ...' should be changed to read 'This timer determines how long to wait in ...'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **42** # i-272

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *Editorial*

This is not a "should" in the usual standards sense of the word

SuggestedRemedy

Change "should" to "needs to be"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **45** # i-320

Baggett, Tim Microchip Technology, Inc.

Comment Type **E** *Comment Status* **D** *PLCA_TIMINGS*

*** Comment submitted with the file 100633500003-baggett_3cg_plca_timing_01_0519.pdf attached ***

More specific guidance may be provided to the system integrator in selecting a proper value for the PLCA to_timer when implementing a mixing segment that exceeds the "up to at least 25m" length or medium with different velocity of propagation. The following text change describes in additional detail the effects the medium propagation and PHY delays have in determining the transmit opportunity time.

See baggett_3cg_plca_timing_01_0519.pdf

SuggestedRemedy

Change the description of to_timer in lines 45-52 to read as follows:

The transmit opportunity timer maps to aPLCATransmitOpportunityTimer. The timer value should meet Equation (148-2). to_timer shall be set equal across the mixing segment for PLCA to work properly.
Duration: integer number between 1 and 255, expressed in bit times.

to_timer > max(2 * t_propdelay) + max(TX_EN sampled to MDI output) + max(MDI input to CRS asserted) + max(MDI input to CRS deasserted) - min(MDI input to CRS deasserted) (148-2)

where:
t_propdelay is the propagation delay between any two nodes on the mixing segment, and the delay specifications are the maxima and minima for the PHY type on the mixing segment (for 10BASE-T1S, see 147.11).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change the description of to_timer in lines 45-52 to read as follows:

The transmit opportunity timer maps to aPLCATransmitOpportunityTimer. The timer value needs to meet Equation (148-2). to_timer shall be set equal across the mixing segment for PLCA to work properly.
Duration: integer number between 1 and 255, expressed in bit times.

to_timer > max(2 * t_propdelay) + max(TX_EN sampled to MDI output) + max(MDI input to CRS asserted) + max(MDI input to CRS deasserted) - min(MDI input to CRS deasserted) (148-2)

where:
t_propdelay is the propagation delay between any two nodes on the mixing segment, and the delay specifications are the maxima and minima for the PHY type on the mixing segment (for 10BASE-T1S, see 147.11).

With respect to thesuggested remedy the "should" statement at the beginning of the sentence has been replaced with a "needs to be" to be coherent with proposed resolution of comment i-272.

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **51** # i-427

Brandt, David Rockwell Automation

Comment Type **T** *Comment Status* **D** *PLCA_LIMITS*

Even when the variable delay line length is less than slotTime, it is possible to configure a node to overrun the delay line before a transmit opportunity arrives. For example, if to_timer is set to 255 and there are more than 2 nodes, the delay line can fill before the transmit opportunity arrives. Other combinations of settings can lead to the same error.

SuggestedRemedy

Add to the B exist condition of the HOLD state of Figure 148-4, a check to exit if the variable delay line is full. The delay line will be emptied by the action of the state diagram, and the node will transmit into a subsequent transmit opportunity. Flag the error condition in Clause 30.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accommodated by i-425.

Proposed resolution of comment i-425 is:
PROPOSED ACCEPT IN PRINCIPLE.
The CRG agrees with the commenter that the PLCA delay line length needs further specification to avoid crossing the MAC late collision threshold. The proposed solution is to limit the variable delay line maximum length to one slotTime minus a margin. This margin is calculated in such a way to compensate for the MAC and the RS own delays.
Additionally, the PLCA DATA state diagrams need to handle the case where the delay line overflows by switching to the COLLIDE state to defer transmission until the next transmit opportunity.
For a detailed description of the issue and the proposed solution, see http://www.ieee802.org/3/cg/public/adhoc/Koczwara_3cg_Specifying%20PLCA%20delay%20and%20overflow%20behavior_v2p0.pdf

Implement the following text changes:

In Figure 148-4, apply the following changes:
[1] in the transition from the "HOLD" state to the "A" connector replace "recv_timer_done + receiving" with "recv_timer_done + receiving + a = delay_line_length"

[2] remove the transition arrow (and related condition) from the "COLLIDE" to the "PENDING" state.

[3] add a state named "DELAY_PENDING" between the "COLLIDE" and the "PENDING" state.

[4] In the action box of the "DELAY_PENDING" state, add "start_pending_timer" and "SIGNAL_STATUS <= NO_SIGNAL_ERROR"

[5] Add a transition from the "COLLIDE" state to the "DELAY_PENDING" state with the following condition: "!plca_txen"

[6] Add a transition from the "DELAY_PENDING" state to the "PENDING" state with the following condition: "pending_timer_done"

[7] from the action box of the "PENDING" state, delete "CARRIER_STATUS <= CARRIER_ON" and "SIGNAL_STATUS <= NO_SIGNAL_ERROR"

Grant editorial license to re-draw Figure 148-4 according to IEEE 802.3 style

From 148.4.6.1 at page 225, line 33, remove "The variable delay line length is no greater than to_timer × plca_node_count + beacon_timer."

At page 225, line 45 change " switching to
PENDING state." to " switching to
DELAY_PENDING state. The PLCA Data State Diagram switches to the PENDING state after waiting for the pending_timer. The pending_timer is used to prevent committing to a transmit opportunity before transmit data is available. This prevents conveying unwanted long COMMIT requests to the PHY."

Append the following text to 148.4.6.4 Timers:
"pending_timer
Defines the time the PLCA Data State Diagram waits in the DELAY_PENDING state before switching to PENDING state.
Duration: 512 bit times.
Tolerance: +/- 1/2 bit time."

Add subclause 148.4.6.5 Constants
"delay_line_length
This constant is implementation dependent and specifies the maximum length of the PLCA RS variable delay line depicted in figure 148-2.
Value: up to 480 bit times"

Append the following text to 148.4.3.1.2 Semantic of the service primitive:
"The mapping of this primitive to the plca_txen and plca_txd variables shall be accomplished in less than or equal to 8 bit times."

Cl **148** *SC* **148.4.5.4** *P* **224** *L* **52** # i-273

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Editorial*

It would be helpful to include the default value here

SuggestedRemedy

Add text: The default value specified in Clause 30 is 20.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Add text: The default value is specified in 30.3.9.2.5

In the editor's opinion duplicating the text could make the maintenance more complicated in the future. A reference is usually better.

Cl **148** *SC* **148.4.6.1** *P* **225** *L* **9** # i-274

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Editorial*

Clarify

SuggestedRemedy

Change to:...transmit opportunity on the media is detected.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
The RS does not detect activity on the media, but maps detected activity conveyed in MII signals from the PMA/PCS to MAC/PLS primitives.

Cl **148** *SC* **148.4.6.1** *P* **225** *L* **22** # i-149

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

In this case the Data state diagram switches to the COLLIDE state asserting ... (add comma after "case")

SuggestedRemedy

In this case, the Data state diagram switches to the COLLIDE state asserting ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **225** *L* **33** # i-425

Brandt, David Rockwell Automation

Comment Type **T** *Comment Status* **D** *PLCA_LIMITS*

The existing draft allows configuration of compliant implementations in a way that violates a rule of CSMA/CD physical layer design - that the delay in the physical layer should not be allowed to be so long that late collisions can occur. The variable delay line length is allowed to be up to to_timer * plca_node_count + beacon_timer. The delay line should be limited to less than the slotTime in order to avoid late collisions.

SuggestedRemedy

Change from:
The variable delay line is a small buffer that aligns a transmission with the transmit opportunity. The variable
delay line length is no greater than to_timer * plca_node_count + beacon_timer.

To:
The variable delay line is a small buffer that aligns a transmission with the transmit opportunity. The variable
delay line length shall be less than slotTime.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
The CRG agrees with the commenter that the PLCA delay line length needs further specification to avoid crossing the MAC late collision threshold. The proposed solution is to limit the variable delay line maximum length to one slotTime minus a margin. This margin is calculated in such a way to compensate for the MAC and the RS own delays. Additionally, the PLCA DATA state diagrams need to handle the case where the delay line overflows by switching to the COLLIDE state to defer transmission until the next transmit opportunity.
For a detailed description of the issue and the proposed solution, see http://www.ieee802.org/3/cg/public/adhoc/Koczwara_3cg_Specifying%20PLCA%20delay%20and%20overflow%20behavior_v2p0.pdf

Implement the following text changes:

In Figure 148-4, apply the following changes:
[1] in the transition from the "HOLD" state to the "A" connector replace "recv_timer_done + receiving" with "recv_timer_done + receiving + a = delay_line_length"

[2] remove the transition arrow (and related condition) from the "COLLIDE" to the "PENDING" state.

[3] add a state named "DELAY_PENDING" between the "COLLIDE" and the "PENDING" state.

[4] In the action box of the "DELAY_PENDING" state, add "start_pending_timer" and

"SIGNAL_STATUS <= NO_SIGNAL_ERROR"

[5] Add a transition from the "COLLIDE" state to the "DELAY_PENDING" state with the following condition: "!plca_txen"

[6] Add a transition from the "DELAY_PENDING" state to the "PENDING" state with the following condition: "pending_timer_done"

[7] from the action box of the "PENDING" state, delete "CARRIER_STATUS <= CARRIER_ON" and "SIGNAL_STATUS <= NO_SIGNAL_ERROR"

Grant editorial license to re-draw Figure 148-4 according to IEEE 802.3 style

From 148.4.6.1 at page 225, line 33, remove "The variable delay line length is no greater than to_timer × plca_node_count + beacon_timer."

At page 225, line 45 change " switching to
PENDING state." to " switching to
DELAY_PENDING state. The PLCA Data State Diagram switches to the PENDING state after waiting for the pending_timer. The pending_timer is used to prevent committing to a transmit opportunity before transmit data is available. This prevents conveying unwanted long COMMIT requests to the PHY."

Append the following text to 148.4.6.4 Timers:
"pending_timer
Defines the time the PLCA Data State Diagram waits in the
DELAY_PENDING state before switching to PENDING state.
Duration: 512 bit times.
Tolerance: +/- 1/2 bit time."

Add subclause 148.4.6.5 Constants
"delay_line_length
This constant is implementation dependent and specifies the maximum length of the PLCA RS variable delay line depicted in figure 148-2.
Value: up to 480 bit times"

Append the following text to 148.4.3.1.2 Semantic of the service primitive:
"The mapping of this primitive to the plca_txen and plca_txd variables shall be accomplished in less than or equal to 8 bit times."

Cl **148** *SC* **148.4.6.1** *P* **225** *L* **40** # i-187

Xu, Dayin — Rockwell Automation

Comment Type **E** *Comment Status* **D** *Editorial*

Reword the text "If another node starts a transmission after meeting its own transmit opportunity, delayed data cannot be held anymore and a collision is triggered by switching to COLLIDE state."

SuggestedRemedy

Change " If another node starts a transmission after meeting its own transmit opportunity, delayed data cannot be held
anymore and a collision is triggered by switching to COLLIDE state. " to " If another node starts a transmission during the HOLD state, the delayed data is dropped and a collision is triggered by switching to COLLIDE state."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **225** *L* **46** # i-379

Law, David — Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

It isn't entirely clear what the 'it' in the text 'When the MAC is done sending the jam bits as described in Clause 4, it waits for the ...' is. It appears it might be the MAC, but I think it is actually the PLCA Data state diagram.

SuggestedRemedy

Suggest that the text 'When the MAC is done sending the jam bits as described in Clause 4, it waits for the ...' be changed to read 'When the MAC has completed sending the jam bits as described in Clause 4, the PLCA Data state diagram waits for the ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **3** # i-177

Lewis, Jon — Dell EMC

Comment Type **E** *Comment Status* **D** *EZ*

Arrows and Lines in Figure 148-4 are not connsistent.

SuggestedRemedy

Change the figure to align the thickness of the lines and the size of the arrows.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **7** # i-380

Law, David — Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

The variable CRS is used in Figure 148-4 'PLCA DATA state diagram' but is missing from subclause 148.4.6.2 'PLCA Data variables'.

SuggestedRemedy

Suggest that the following definition should be added to subclause 148.4.6.2 'PLCA Data variables':

CRS
The MII signal CRS (see 22.2.2.11).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **26** # i-426

Brandt, David — Rockwell Automation

Comment Type **T** *Comment Status* **D** *State Diagram*

The exit condition on the left side of the IDLE state is incorrect. If !plca_en occurred, we would return to the NORMAL state.

SuggestedRemedy

From:
receiving * !plca_en * tx_cmd = NONE

To:
receiving * !plca_txen * tx_cmd = NONE

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Accommodated by resolution of comment i-193

Proposed Resolution of comment i-193 is:
PROPOSED ACCEPT IN PRINCIPLE.
Replace "receiving * !plca_en * tx_cmd = NONE" with "receiving * (!plca_txen)) * (tx_cmd = NONE)"

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **26** # i-193

Beruto, Piergiorgio — Canova Tech S.r.l.

Comment Type **E** *Comment Status* **D** *State Diagram*

In figure 148-4, in the transition from "IDLE" to "RECEIVE" state,
the condition reads "receiving * !plca_en * tx_cmd = NONE".
The use of plca_en variable looks wrong here. It appears that text was changed as a result of
the implementation of comment #247 on draft 2.2 but the approved text did not meet the draft (see
http://www.ieee802.org/3/cg/public/Jan2019/beruto_3cg_burst_mode_fixes_revC.PDF slide #7).

SuggestedRemedy

In figure 148-4, in the transition from "IDLE" to "RECEIVE" state,
replace "plca_en" with "plca_txen".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Replace "receiving * !plca_en * tx_cmd = NONE" with "receiving * (!plca_txen)) * (tx_cmd = NONE)"

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **27** # i-381

Law, David — Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

The variables tx_cmd and rx_cmd are used in Figure 148-4 'PLCA DATA state diagram' but are missing from subclause 148.4.6.2 'PLCA Data variables'. I assume that tx_cmd and rx_cmd are the same variables as tx_cmd and rx_cmd defined in 148.4.5.2 'PLCA Control variables'.

SuggestedRemedy

Suggest that the following definitions should be added to subclause 148.4.6.2 'PLCA Data variables':

tx_cmd
See 148.4.5.2.

rx_cmd
See 148.4.5.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **30** # i-188

Beruto, Piergiorgio Canova Tech S.r.l.

Comment Type **T** *Comment Status* **D** *State Diagram*

*** Comment submitted with the file 100619700003-fig_148_4.png attached ***

In figure 148-4 in the "RECEIVE" state box, CARRIER_STATUS is set according to CRS and rx_cmd. According to IEEE state diagram representation, such assignment is only evaluated once when first entering the RECEIVE state. This is not the intended behavior, the CARRIER_STATUS parameter needs to be updated anytime the expression changes because of CRS or rx_cmd.

SuggestedRemedy

Add a recirculating arc to the RECEIVE state with 'ELSE' as a condition. See also attached figure.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **38** # i-275

Thompson, Geoffrey Independent Consultant

Comment Type **E** *Comment Status* **D** *Editorial*

Vertically compress state diagram.

SuggestedRemedy

Move HOLD state to the intersection of the RECEIVE and ABORT shadows. Move HOLD loop on itself from left to right side.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **226** *L* **43** # i-382

Law, David Hewlett Packard Enterprise

Comment Type **T** *Comment Status* **D** *Editorial*

The counter recv_timer is used in Figure 148-4 'PLCA DATA state diagram' but is missing from subclause 148.4.6.4 'Timers'. I assume it is the same timer as recv_timer defined in subclause 148.4.5.4 'Timers'.

SuggestedRemedy

Suggest that the following definition should be added to subclause 148.4.5.4 'Timers':

recv_timer
See 148.4.5.4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **227** *L* **19** # i-383

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Please move the committed condition on the transition from PENDING to WAIT_MAC to be just below the PENDING state.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **227** *L* **24** # i-384

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Please move the plca_txen condition on the transition from WAIT_MAC to TRANSMIT to be adjacent to the line it is associated with.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **227** *L* **31** # i-385

Law, David Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *Editorial*

There is no definition for the mean of the subscript n-a in relation to plca_txd.

SuggestedRemedy

Define the meaning of the subscript n-a in subclause 148.4.6.1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

148.4.3.1.2 Change "The values ONE and ZERO are conveyed by the PLCA variables plca_txd<3>, plca_txd<2>, plca_txd<1>, and plca_txd<0>, each of which conveys"

to

"The values ONE and ZERO are conveyed by the individual bits of the four-bit variable plca_txd<3:0>. Each bit of plca_txd<3:0> conveys..."

Additionally, on page 228, line 11, change the description of plca_txd as follows:
Change from "plca_txd See 148.4.3.1.2"

to

"plca_txd<3:0> A four-bit data value conveying a nibble of data to transmit from four successive PLS_DATA.request(OUTPUT_UNIT) primitives where OUTPUT_UNIT has a value of ONE or ZERO. See 148.4.3.1.2."

Cl **148** *SC* **148.4.6.1** *P* **227** *L* **45** # i-386

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Missing 'THEN' in IF-THEN-ELSE-END construct

SuggestedRemedy

Change 'IF COL' to read 'IF COL THEN' in the FLUSH state of Figure 148-4 'PLCA DATA state diagram (continued)'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.1** *P* **227** *L* **51** # i-276

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *Editorial*

3 different arcs with different terms coming into a join.

SuggestedRemedy

Shorten each arc and terminate separately with a "To C" symbol.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.6.2** *P* **228** *L* **25** # i-387

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *Editorial*

Suggest that cross-references to related Clause 22 subclauses be added for TXD, TX_EN, TX_ER and COL.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

At page 228, line 26, replace description of TXD with: "The MII signals TXD<3:0> specified in 22.2.2.4".

At page 228, line 29, replace description of TX_EN with: "The MII signal TXEN specified in 22.2.2.3.".

At page 228, line 32, replace description of TX_ER with: "The MII signal TXER specified in 22.2.2.5.".

At page 228, line 34, replace description of COL with: "The MII signal COL specified in 22.2.2.12".

Cl **148** *SC* **148.4.6.2** *P* **228** *L* **40** # i-388

Law, David — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **D** *Editorial*

As noted in Figure 148-2 'PLCA functions within the Reconciliation Sublayer (RS)' and elsewhere in the IEEE P802.3cg draft, the TX_CLK is sourced from the PHY. In addition the relationship between MCD, that defines the when TXD, TX_EN and TX_ER change value in the TRANSMIT state, and phase of TX_CLK needs to be defined to meet subclause 22.3.1. MCD should therefore be derived from a free-running timer that expires synchronously with the rising edge of TX_TCLK.

SuggestedRemedy

[1] Add a new subclause as follows:

148.4.6.5 Abbreviations
MCD
Alias for mii_clock_timer_done.

[2] Add a new timer to subclause 148.4.6.4 as follows:

mii_clock_timer
A continuous free-running timer that shall expire synchronously with the rising edge of TX_TCLK.
Restart time: Immediately after expiration; restarting the timer resets the condition mii_clock_timer_done.'.
Duration: see 22.2.2.1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.7.1** *P* **229** *L* **10** # i-194

Beruto, Piergiorgio — Canova Tech S.r.l.

Comment Type **E** *Comment Status* **D** *Editorial*

The plca_status variable should follow the same syntax as the link_status parameter in 146.2.2.1 and 147.2.5.1.

SuggestedRemedy

At page 229, line 10, replace "FALSE" with FAIL.
At page 229, line 12, replace "TRUE" with OK.
At page 229, line 15, replace "TRUE" with OK.
At page 229, line 19, replace "FALSE" with FAIL.
In figure 148-5, in the "INACTIVE" state box, change "plca_status <= FALSE" with "plca_status <= FAIL"
In figure 148-5, in the "ACTIVE" state box, change "plca_status <= TRUE" with "plca_status <= OK"
At page 229, line 52, replace "If plca_status is true" with "If plca_status is OK".
At page 229, line 53, replace "If plca_status is false" with "If plca_status is FAIL".
At page 230, line 2, replace "Values: TRUE or FALSE" with "Values: OK or FAIL".
At page 230, line 13, replace "time plca_status is maintained in TRUE state" with "time plca_status is maintained in OK state".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.7.2** *P* **229** *L* **51** # i-150

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If plca_status is true, ... (TRUE is if capital letters in the rest of the page)

SuggestedRemedy

If plca_status is TRUE, ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.7.2** *P* **229** *L* **53** # i-151

Graber, Steffen — Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

If plca_status is false, ... (FALSE is in capital letters in the rest of the page)

SuggestedRemedy

If plca_status is FALSE, ...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **148** *SC* **148.4.7.4** *P* **230** *L* **13** # i-277

Thompson, Geoffrey Independent Consultant

Comment Type **TR** *Comment Status* **D** *PLCA_TIMERS*

Also Figure 148-5. The timer is very weakly defined. It only specifies the duration of the timer, not whether it is reset by a plca_reset nor whether it is reset by being "done and entering another state or anything else. Further, when the state is returned to ACTIVE from HYSTERESIS there is no modification to the timer setting so the operation of the timer degrades should there be noise on the !plca_active input no matter how far apart the noise events are.

SuggestedRemedy

Fully specify the operation pf the timer.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
delete "stop plca_status_timer" from "ACTIVE" state in Figure 148-5.

The behaviour of the timers is specified in 148.1.1.2. They operate in the manner described in 40.4.5.2. This means that "start timer_xxx" implies a reset of the timer, while "stop timer_xxx" has no effect on an already "done" timer.

The timer status is only checked in the HYSTERESIS state, and it is reset on entry of the same state. This means that its status has no effect when the PLCA Status State Diagram is in any state other than HYSTERESIS.

In other words, this diagram represents an hold-on filter over the plca_active variable.

Cl **98** *SC* **98B.3** *P* **235** *L* **11** # i-154

Marris, Arthur Cadence Design Systems, Inc.

Comment Type **TR** *Comment Status* **D** *Editorial*

Put the two unchanged rows into Table 98B-1 it will make things clearer.

SuggestedRemedy

Delete "(unchanged rows not shown)" on line 11

Add the following to Table 98B-1:
A0 100BASE-T1 ability
A2 1000BASE-T1 ability

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146A.1** *P* **236** *L* **17** # i-264

Thompson, Geoffrey Independent Consultant

Comment Type **ER** *Comment Status* **D** *Safety*

The text's description of the relationship to safety may twitch the IEEE lawyers. I would prefer to state it in a manner that is a little more removed.

SuggestedRemedy

Replace paragraph with: Defining "intrinsically safe", an intrinsically safe system and the limits of parameters used for intrinsically safe communications circuits is established by International Standards (Ref: Please provide correct reference). The specification of 10BASE-T1L in Clause 146 is intended to be compatible with implementation of such intrinsically safe systems.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Replace paragraph with:
Equipment protection by intrinsic safety is described by International Standards, e.g. IEC60079-11:2011. Possible limits of parameters used for intrinsically safe communication circuits can be derived from these standards. The specification of 10BASE-T1L in Clause 146 is intended to be compatible with implementation of such intrinsically safe systems.

Cl **146** *SC* **146.20** *P* **239** *L* **22** # i-389

Law, David Hewlett Packard Enterprise

Comment Type **E** *Comment Status* **D** *PoDL*

Suggest that Annex 146B should be addressing optional power distribution in terms of IEEE Std 802.3 Clause 104 PoDL. As a result 'Single-pair PSE' should be change to read 'PoDL PSE' and 'Single-pair PD' should be change to read 'PoDL PD' throughout Annex 146B.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.20.1.1.1** *P* **240** *L* **9** # i-152

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

mm (AWG) (it is not exactly clear, what "mm" means)

SuggestedRemedy

Diameter in mm (AWG)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **146** *SC* **146.20.1.1.1** *P* **240** *L* **18** # i-153

Graber, Steffen Pepperl+Fuchs GmbH

Comment Type **E** *Comment Status* **D** *EZ*

1.02(18) (Space is missing)

SuggestedRemedy

1.02 (18)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.