802.3cp Protocol Implementation Conformance Statement (PICS)

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PICS

- Protocol implementation conformance statement (PICS) is provided at the end of each clause with new capabilities
- It is a guide on how to implement “shall” statements in the standards
- 802.3cp needs PICS for Clauses 158, 159, 160
- This contribution uses Clause 158 as an example

Major capability

Item	Feature	Subclause	Value/Comment	Status	Support
*BR10	10GBASE-BR10 PMD	158.6	Device supports requirements for 10GBASE-BR10 PHY	O.1	Yes [ ] No [ ]
*BR20	10GBASE-BR20 PMD	158.6	Device supports requirements for 10GBASE-BR20 PHY	O.1	Yes [ ] No [ ]
*BR40	10GBASE-BR40 PMD	158.6	Device supports requirements for 10GBASE-BR40 PHY	O.1	Yes [ ] No [ ]
*BR40+	10GBASE-BR40+ PMD	158.6	Device supports requirements for 10GBASE-BR40+ PHY	O.1	Yes [ ] No [ ]
*INS	Installation / cable	158.10	Items marked with INS include installation practices and cable specifications not applicable to a PHY manufacturer	O	Yes [ ] No [ ]
TP1	Reference point TP1 exposed and available for testing	158.5.1	This point may be made available for use by implementers to certify component conformance	O	Yes [ ] No [ ]
TP4	Reference point TP4 exposed and available for testing	158.5.1	This point may be made available for use by implementers to certify component conformance	O	Yes [ ] No [ ]
DC	Delay constraints	158.3	Device conforms to delay constraints	M	Yes [ ]
*MD	MDIO capability	158.4	Registers and interface supported	O	Yes [ ] No [ ]

- This table lists major capabilities and options the clause specifies
- Clause 158 specifies
  - 10GBASE-BR10, BR20, BR40, and BR40+ PMDs
  - Fiber cable characters and installation
  - Key reference points (TP1, TP4) in the Tx/Rx path
  - Delay constrains
  - MDIO (management data in/out) for media independent interface

PMD functional specifications

Item	Feature	Subclause	Value/Comment	Status	Support
F1	Compatible with 10GBASE-R PCS and PMA	158.1		M	Yes [ ]
F2	Integration with management functions	158.1		O	Yes [ ] No [ ]
F3	Bit error ratio	158.1.1	Meets the BER specified in 158.1.1	M	Yes [ ] ~~No [ ]~~ ~~N/A [ ]~~
F4	Transmit function	158.5.2	Conveys bits from PMD service interface to MDI	M	Yes [ ]
F5	Mapping between optical signal and logical signal for transmitter	158.5.2	Higher optical power is a one	M	Yes [ ]
F6	Receive function	158.5.3	Conveys bits from MDI to PMD service interface	M	Yes [ ]
F7	Conversion of optical signal to electrical signal	158.5.3	For delivery to the PMD service interface	M	Yes [ ]
F8	Mapping between optical signal and logical signal for receiver	158.5.3	Higher optical power is a one	M	Yes [ ]
F9	Global Signal Detect function	158.5.4	Report to the PMD service interface the message PMD:IS_SIGNAL.indication (SIGNAL_DETECT)	M	Yes [ ]
F10	Global Signal Detect behavior	158.5.4	SIGNAL_DETECT is a global indicator of the presence of an	M	Yes [ ]

- This table lists PMD functions from Subclauses 158.1 and 158
- The “shall”s are about
  - BER
  - Tx
  - Rx
  - Global signal detection

Management functions

Item	Feature	Subclause	Value/Comment	Status	Support
M1	Management register set	158.4		MD:M	Yes [ ] N/A [ ]
M2	Global transmit disable function	158.5.6	Disables the optical transmitter with the PMD_global_transmit_disable variable	MD:O	Yes [ ] No [ ] N/A [ ]
M3	PMD_receive_fault function	158.5.9	PMD_receive_fault is the logical OR of NOT SIGNAL_DETECT and any implementation specific fault	MD:O	Yes [ ] No [ ] N/A [ ]

- Management functions are based on “shall”s in subclauses 158.4 and 158.5
- They are related to the MDIO capability

PMD to MDI optical specifications

Item	Feature	Subclause	Value/Comment	Status	Support
BR101	Transmitter meets specifications in Table 158–6	158.6.1	Per measurement techniques defined in 158.8	BR10:M	Yes [ ] N/A [ ]
BR102	Receiver meets specifications in Table 158-7	158.6.2	Per measurement techniques defined in 158.8	BR10:M	Yes [ ] N/A [ ]

- PMD to MDI optical spec tables are based on Clause 158 PMD types (BR10, BR20, BR40, BR40+)
- Two “shall”s in Subcaluses 158.6.1 and 158.6.2
  - *“The 10GBASE-BR10, 10GBASE-BR20, 10GBASE-BR40, and 10GBASE-BR40+ transmitters shall meet the specifications defined in Table 158–6 per measurement techniques defined in 158.8.”*
  - *“The 10GBASE-BR10, 10GBASE-BR20, 10GBASE-BR40, and 10GBASE-BR40+ receivers shall meet the specifications defined in Table 158–7 per measurement techniques defined in 158.8.”*

Optical measurement methods

Item	Feature	Subclause	Value/Comment	Status	Support
M1	General measurement	158.8	Meets the specifications defined in 52.9	M	Yes [ ]
M2	Stressed receiver conformance test	158.8	The transmitted optical signal and the reflectance of the optical link should be at their maximum levels	M	Yes [ ]

- Two “shall”s in Subclause 158.8
  - *“All optical measurements shall meet the specifications defined in 52.9.”*
  - *“The stressed receiver conformance test shall be conducted under the additional condition that the transmitted optical signal and the reflectance of the optical link should be at their maximum levels.”*

Environmental specifications

Item	Feature	Subclause	Value/Comment	Status	Support
ES1	General safety	52.10.1	Conformance to IEC-60950-1	M	Yes [ ]
ES2	Laser safety —IEC Hazard Level 1	52.10.2	Conform to Hazard Level 1 laser requirements defined in IEC 60825-1 and IEC 60825-2	M	Yes [ ]
ES3	Installation	52.10.3	Follow applicable local codes and regulations	M	Yes [ ]
ES4	Electromagnetic interference	52.11.1	Comply with applicable local and national codes for the limitation of electromagnetic interference	M	Yes [ ]

- Two “shall”s in Subclause 158.9
  - *“Safety and installation shall meet the specifications defined in 52.10.”*
  - *“Environment and labeling shall meet the specifications defined in 52.11 and 52.12.”*

Characteristics of fiber optic cabling and MDI

Item	Feature	Subclause	Value/Comment	Status	Support
OC1	Fiber optic cabling	158.11	Meets the specifications defined in Table 158–10	INS: M	Yes [ ] N/A [ ]
OC2	Maximum discrete reflectance	158.11.2.2	Less than –20 dB for 10GBASE-BR10, less than –26 dB. for 10GBASE-BR20,10GBASE-BR40, and 10GBASE-BR40+	INS: M	Yes [ ] N/A [ ]
OC3	MDI requirements	158.11.3	Meets IEC 61753-1-1, IEC 61753-021-2, and IEC 61753-022-2	INS: M	Yes [ ] N/A [ ]

- Three “shall”s in Subclause 158.11
  - *“The 10GBASE-BRx fiber optic cabling shall meet the specifications defined in Table 158–10.”*
  - *“The maximum discrete reflectance for 10GBASE-BR10 shall be less than –20 dB. The maximum discrete reflectance for 10GBASE-BR20,10GBASE-BR40, and 10GBASE-BR40+ shall be less than –26 dB.”*
  - *“When the MDI is a connector plug and receptacle connection, it shall meet the interface performance specifications of the following”*

Proposal

- It is proposed to use the example in this contribution to specify PICS subclauses in Clauses 158, 159, 160
- It is proposed to address 3 PICS comments to .3cp D1.2 by using the above resolution