58.10.3 Optical fiber connection

The maximum link distances for single-mode fiber are calculated based on an allocation of 2 dB total connection and splice loss. Connections with different loss characteristics may be used provided the requirements of Table 58–1 are met.

The maximum discrete reflectance of e.g. a connection or splice shall be less than -26 dB.

58.10.4 Medium Dependent Interface (MDI)

The 100BASE-LX10, 100BASE-BX10-D or 100BASE-BX10-U PMD is coupled to the fiber optic cabling at the MDI. The MDI is the interface between the PMD and the "fiber optic cabling" (as shown in Figure 58–12). Examples of an MDI include:

a) Connectorized fiber pigtail;
b) PMD receptacle.

The MDI carries the signal in both directions. For 100BASE-BX10 it couples a single fiber and for 100BASE-LX10 it couples dual fibers.

When the MDI is a rematable connection it shall meet the interface performance specifications of IEC 61753-1.

NOTE— Compliance testing is performed at TP2 and TP3 as defined in 58.3.1, not at the MDI.

58.11 Protocol Implementation Conformance Statement (PICS) proforma for Clause 58, Physical Medium Dependent (PMD) sublayer and medium, type 100BASE-LX10 (Long Wavelength) and 100BASE-BX10 (BiDirectional Long Wavelength)[1]

58.11.1 Introduction

The supplier of a protocol implementation that is claimed to conform to IEEE Std 802.3ah-200x, Clause 58, Physical Medium Dependent (PMD) sublayer and medium, type 100BASE-LX10 and 100BASE-BX10, shall complete the following Protocol Implementation Conformance Statement (PICS) proforma. A detailed description of the symbols used in the PICS proforma, along with instructions for completing the PICS proforma, can be found in Clause 21.

58.11.2 Identification

58.11.2.1 Implementation identification

Supplier[1]	
Contact point for enquiries about the PICS[1]	
Implementation Name(s) and Version(s)[1,3]	
Other information necessary for full identification—e.g., name(s) and version(s) for machines and/or operating systems; System Name(s)[2]	
NOTES 1—Required for all implementations. 2—May be completed as appropriate in meeting the requirements for the identification. 3—The terms Name and Version should be interpreted appropriately to correspond with a supplier's terminology (e.g., Type, Series, Model).	

58.11.2.2 Protocol summary

Identification of protocol standard	IEEE Std 802.3ah-200x, Clause 58, Physical Medium Dependent (PMD) sublayer and medium, type 100BASE-LX10 and 100BASE-BX10
Identification of amendments and corrigenda to this PICS proforma that have been completed as part of this PICS	
Have any Exception items been required? No [ ] Yes [ ] (See Clause 21; the answer Yes means that the implementation does not conform to IEEE Std 802.3ah-200x.)	

Date of Statement	

[1]*Copyright release for PICS proformas:* Users of this standard may freely reproduce the PICS proforma in this annex so that it can be used for its intended purpose and may further publish the completed PICS.

58.11.2.3 Major capabilities/options

Item	Feature	Subclause	Value/Comment	Status	Support
MD	MDIO capability	58.2	Registers and interface supported	O	Yes [ ] No [ ]
*PCS	PCS and PMA	58.1	Clause 36 and PMA support	M	Yes [ ] No [ ]
HT	High temperature operation	58.9.4	-5 to 85 °C	O	Yes [ ] No [ ]
LT	Low temperature operation	58.9.4	-40 to 60 °C	O	Yes [ ] No [ ]
*LX	100BASE-LX10 PMD	58.4	Device supports long wavelength (1310 nm) over dual single-mode fiber operation	O/1	Yes [ ] No [ ]
*BD	100BASE-BX10-D	58.5	Device operates with one single single-mode fiber and transmits at downstream wavelength (1550 nm)	O/1	Yes [ ] No [ ]
*BU	100BASE-BX10-U	58.5	Device operates with one single single-mode fiber and transmits at upstream wavelength (1310 nm)	O/1	Yes [ ] No [ ]
*INS	Installation / Cable	58.10	Items marked with INS include installation practices and cable specifications not applicable to a PHY manufacturer	O	Yes [ ] No [ ]

58.11.3 PICS proforma tables for Physical Medium Dependent (PMD) sublayer and medium, type 100BASE-LX10 and 100BASE-BX10

58.11.3.1 PMD functional specifications

Item	Feature	Subclause	Value/Comment	Status	Support
FN1	Transmit function	58.3.2	Conveys bits from PMD service interface to MDI	M	Yes [ ]
FN2	Transmitter optical signal	58.3.2	Higher optical power transmitted is a logic 1	O	Yes [ ] No [ ]
FN3	Receive function	58.3.3	Conveys bits from MDI to PMD service interface	M	Yes [ ]
FN4	Receiver optical signal	58.3.3	Higher optical power received is a logic 1	O	Yes [ ] No [ ]
FN5	Signal detect function	58.3.4	Mapping to PMD service interface	M	Yes [ ]
FN6	Signal detect behavior	58.3.4	Generated according to Table 58–4	M	Yes [ ]

58.11.3.2 PMD to MDI optical specifications for 100BASE-LX10

Item	Feature	Subclause	Value/Comment	Status	Support
LX1	100BASE-LX10 transmitter	58.4.1	Meets specifications in Table 58–5	LX:M	Yes [ ] N/A [ ]
LX2	100BASE-LX10 receiver	58.4.2	Meets specifications in Table 58–6	LX:M	Yes [ ] N/A [ ]
LX3	100BASE-LX10 stressed receiver sensitivity	58.4.2	Meets specification in Table 58–6	LX:O	Yes [ ] No [ ]

58.11.3.3 PMD to MDI optical specifications for 100BASE-BX10-D

Item	Feature	Subclause	Value/Comment	Status	Support
BD1	100BASE-BX10 transmitter	58.5.1	Meets specifications in Table 58–7	BD:M	Yes [ ] N/A [ ]
BD2	100BASE-BX10 receiver	58.5.2	Meets specifications in Table 58–8	BD:M	Yes [ ] N/A [ ]
BD3	100BASE-BX10 stressed receiver sensitivity	58.5.2	Meets specification in Table 58–8	BD:O	Yes [ ] No [ ]

58.11.3.4 PMD to MDI optical specifications for 100BASE-BX10-U

Item	Feature	Subclause	Value/Comment	Status	Support
BU1	100BASE-BX10 transmitter	58.5.1	Meets specifications in Table 58–7	BU:M	Yes [ ] N/A [ ]
BU2	100BASE-BX10 receiver	58.5.2	Meets specifications in Table 58–8	BU:M	Yes [ ] N/A [ ]
BU3	100BASE-LX10 stressed receiver sensitivity	58.5.2	Meets specification in Table 58–8	BU:O	Yes [ ] No [ ]

58.11.3.5 Optical measurement requirements

Item	Feature	Subclause	Value/Comment	Status	Support
OM1	Measurement cable	58.8	2 to 5 meters in length	M	Yes [ ]
OM2	Test pattern	58.8.1, 58.8.8, 58.8.10	For eye, sensitivity, TDP, stressed sensitivity, jitter	M	Yes [ ]
OM3	Wavelength and spectral width	58.8.2	Per TIA/EIA-455-127 under modulated conditions	M	Yes [ ]

Item	Feature	Subclause	Value/Comment	Status	Support
OM4	Average optical power	58.8.3	Per TIA/EIA-455-95	M	Yes [ ]
OM5	Extinction ratio	58.8.4	Per ANSI/TIA/EIA-526-4A	M	Yes [ ]
OM6	$RIN_{12}OMA$	58.8.7	As described in 58.8.7	M	Yes [ ]
OM7	Transmit eye	58.8.8	With specified filter	M	Yes [ ]
OM8	Receiver sensitivity	58.8.10	With specified pattern	M	Yes [ ]
OM9	Transmitter and dispersion penalty	58.8.9	With dispersion, reflection and decision timing offsets	M	Yes [ ]
OM10	Stressed receiver conformance test	58.8.11	Performed in accordance with the requirements of 58.8.11.1, 58.8.11.2, and 58.8.11.3	O	Yes [ ] No [ ]

58.11.3.6 Environmental specifications

Item	Feature	Subclause	Value/Comment	Status	Support
ES1	General safety	58.9.1	Conforms to IEC-60950	M	Yes [ ]
ES2	Laser safety —IEC Class 1	58.9.2	Conform to Class 1 laser requirements defined in IEC 60825-1	M	Yes [ ]
ES3	Documentation	58.9.2	Explicitly defines requirements and usage restrictions to meet safety certifications	M	Yes [ ]
ES4	Operating temperature range labelling	58.9.5	If required	M	Yes [ ] N/A [ ]

58.11.3.7 Characteristics of the fiber optic cabling and MDI

Item	Feature	Subclause	Value/Comment	Status	Support
FO1	Fiber optic cabling	58.10	Dispersion specifications of Table 58–17	INS:M	Yes [ ] N/A [ ]
FO2	End-to-end channel loss	58.1, 58.10	Meet the requirements of Table 58–1	INS:M	Yes [ ] N/A [ ]
FO3	Maximum discrete reflectance	58.10.3	Less than –26 dB	INS:M	Yes [ ] N/A [ ]
FO4	MDI requirements	58.10.4	IEC 61753-1 if rematable	INS:O	Yes [ ] No [ ] N/A [ ]