

59.12 Protocol Implementation Conformance Statement (PICS) proforma for Clause 59, Physical Medium Dependent (PMD) sublayer and medium, type 1000BASE-LX10 (Long Wavelength) and 1000BASE-BX10 (BiDirectional Long Wavelength)¹

59.12.1 Introduction

The supplier of a protocol implementation that is claimed to conform to IEEE Std 802.3ah-200x, Clause 59, Physical Medium Dependent (PMD) sublayer and medium, type 1000BASE-LX10 and type 1000BASE-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.

59.12.2 Identification

59.12.2.1 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).	

59.12.2.2 Protocol summary

Identification of protocol standard	IEEE Std 802.3ah-200x, Clause 59, Physical Medium Dependent (PMD) sublayer and medium, type 1000BASE-LX10 and 1000BASE-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	
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59.12.3 Major capabilities/options

¹Copyright 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.

Item	Feature	Subclause	Value/Comment	Status	Support
MD	MDIO capability	59.2	Registers and interface supported	O	Yes [] No []
*PCS	PCS and PMA	59.1	Clause 36 PCS and PMA support	M	Yes []
HT	High temperature operation	59.10.4	-5 to 85°C	O	Yes [] No []
LT	Low temperature operation	59.10.4	-40 to 60°C	O	Yes [] No []
*LX	1000BASE-LX10 PMD	59.4	Device supports long wavelength (1310 nm) over dual multimode and single-mode fibers.	O/1	Yes [] No []
*BX-D	1000BASE-BX10-D PMD	Table 59-7	Device operates with one single single-mode fiber and transmits at downstream wavelength (1490 nm).	O/1	Yes [] No []
*BX-U	1000BASE-BX10-U PMD	Table 59-7	Device operates with one single single-mode fiber and transmits upstream wavelength (1310 nm).	O/1	Yes [] No []
*INS	Installation / cable	59.11	Items marked with INS include installation practices and cable specifications not applicable to a PHY manufacturer.	O	Yes [] No []
*OFP	Single-mode offset-launch mode-conditioning patch cord	59.11.5	Items marked with OFP include installation practices and cable specifications not applicable to a PHY manufacturer.	O	Yes [] No []

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59.12.3.1 PMD functional specifications

Item	Feature	Subclause	Value/Comment	Status	Support
FN1	Transmit function	59.3.2	Convey bits requested by PMD_UNITDATA.request() to the MDI	M	Yes []
FN2	Transmitter optical signal	59.3.2	Higher optical power is a logical 1.	M	Yes []
FN3	Receive function	59.3.3	Convey bits received from the MDI to PMD_UNITDATA.indicate()	M	Yes []
FN4	Receiver optical signal	59.3.3	Higher optical power is a logical 1.	M	Yes []
FN5	Signal detect function	59.3.4	Mapping to PMD interface	M	Yes []
FN6	Signal detect behavior	59.3.4	Generated according to Table 59-4	M	Yes []

59.12.3.2 PMD to MDI optical specifications for 1000BASE-LX10

Item	Feature	Subclause	Value/Comment	Status	Support
LX1	1000BASE-LX10 transmitter	59.4.1	Transmitter meets specifications in Table 59-5	LX:M	Yes [] N/A []
LX2	Offset-launch mode-conditioning patch cord	59.4.1	Required for LX10 multimode operation	OFP:M	Yes [] N/A []
LX3	1000BASE-LX10 receiver	59.4.2	Receiver meets mandatory specifications in Table 59-7	LX:M	Yes [] N/A []
LX4	1000BASE-LX10 stressed receiver sensitivity	59.4.2	Receiver meets mandatory specifications in Table 59-7	LX:O	Yes [] N/A []

59.12.3.3 PMD to MDI optical specifications for 1000BASE-BX10-D

Item	Feature	Subclause	Value/Comment	Status	Support
BXD1	1000BASE-BX10-D transmitter	59.5.1	Transmitter meets specifications in Table 59-8	BXD:M	Yes [] N/A []
BXD2	1000BASE-BX10-D receiver	59.5.2	Receiver meets mandatory specifications in Table 59-9	BXD:M	Yes [] N/A []
BXD3	1000BASE-BX10-D stressed receiver sensitivity	59.5.2	Receiver meets mandatory specifications in Table 59-9	BXD:O	Yes [] N/A []

59.12.3.4 PMD to MDI optical specifications for 1000BASE-BX10-U

Item	Feature	Subclause	Value/Comment	Status	Support
BXU1	1000BASE-BX10-U transmitter	59.5.1	Transmitter meets specifications in Table 59–8	BXU:M	Yes [] N/A []
BXU2	1000BASE-BX10-U receiver	59.5.2	Receiver meets mandatory specifications in Table 59–9	BXU:M	Yes [] N/A []
BXU3	1000BASE-BX10-U stressed receiver sensitivity	59.5.2	Receiver meets mandatory specifications in Table 59–9	BXU:O	Yes [] N/A []

59.12.3.5 Optical Measurement Requirements

Item	Feature	Subclause	Value/Comment	Status	Support
OM1	Measurement cable		2 to 5 m in length	M	Yes []
OM2	Test patterns	59.9.1	See Table 59–13	M	Yes []
OM3	Wavelength and spectral width	59.9.2	Per TIA/EIA-455-127 under modulated conditions	M	Yes []
OM4	Optical power	59.9.3	Per TIA/EIA-455-95	M	Yes []
OM5	Extinction ratio	59.9.4	Per ANSI/TIA/EIA-526-4A using patch cable per 59.9.8 using forth-order Bessel-Thomson filter and patch cable per 59.9	M	Yes []
OM6	RIN ₁₂ OMA	58.8.7	As described in 58.8.7	M	Yes []
OM7	Transmit optical waveform (transmit eye)	59.9.8	Using fourth-order Bessel-Thomson filter per , using patch cable per 59.9	M	Yes []
OM8	Transmit rise/fall characteristics	59.9.9	Waveforms conform to mask in Figure 59–4, measure from 20% to 80%, using patch cable per 59.9	LX:M	Yes []
OM9	Transmitter and dispersion penalty	59.9.10	As described in 58.8.9	M	Yes []
OM10	Receive sensitivity	59.9.11	With specified pattern	M	Yes []
*OM11	Stressed receiver conformance	59.9.14	As described in 59.9.14	O	Yes [] N/A []
OM12	Receiver 3dB electrical upper cutoff frequency	59.9.15	As described in 59.9.15	M	Yes []

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59.12.3.6 Environmental, safety and labeling specifications

Item	Feature	Subclause	Value/Comment	Status	Support
ES1	General safety	59.10.1	Conforms to IEC 60950	M	Yes []
ES2	Laser safety - IEC Class 1	59.10.2	Conforms to Class 1 laser requirements defined in IEC 60825-1	M	Yes []
ES3	Documentation	59.10.2	Explicitly define requirements and usage restrictions to meet safety certifications	M	Yes []
ES4	Operating temperature range labeling	59.10.5	If required, label range over which compliance is ensured	M	Yes [] N/A []

59.12.3.7 Characteristics of the fiber optic cabling

Item	Feature	Subclause	Value/Comment	Status	Support
FO1	Fiber optic cabling	59.11	Meets specifications in Table 59-18	INS:M	Yes [] N/A []
FO2	End-to-end channel loss	59.11.1	Meet the requirements specified in Table 59-1	INS:M	Yes [] N/A []
FO3	Maximum discrete reflectance for multimode connections	59.11.3	Less than -20 dB	INS:M	Yes [] N/A []
FO4	Maximum discrete reflectance for single-mode connections	59.11.3	Less than -26 dB	INS:M	Yes [] N/A []
FO5	MDI Requirements	59.11.4	Meet the interface performance specifications of IEC 61753-1, if remateable	INS:O	Yes [] No [] N/A []

59.12.3.8 Offset-launch mode-conditioning patch cord

Item	Feature	Subclause	Value/Comment	Status	Support
LPC1	Offset-launch mode-conditioning patch cord	59.11.5	Meet conditions of 59.11.5	OFP:M	Yes [] N/A []
LPC2	Single-mode ferrules in offset-launch mode-conditioning patch cords	59.11.5	IEC 61754-4: 1997 [B25]grade 1 ferrule	OFP:M	Yes [] N/A []
LPC3	Single-mode fiber in offset-launch mode-conditioning patch cords	59.11.5	Per 59.11.5	OFP:M	Yes [] N/A []
LPC4	Multimode fiber in offset-launch mode-conditioning patch cords	59.11.5	Same type as used in cable plant	OFP:M	Yes [] N/A []