

## 91.11 Protocol implementation conformance statement (PICS) proforma for Clause 91, Physical Medium Dependent (PMD) sublayer and medium, type 10GBASE-PR (symmetric 10 Gb/s long wavelength passive optical networks) and 10/1GBASE-PRX (asymmetric 10 Gb/s downstream, 1 Gb/s upstream long wavelength passive optical networks)<sup>1</sup>

### 91.11.1 Introduction

The supplier of a protocol implementation that is claimed to conform to Clause 91, Physical Medium Dependent (PMD) sublayer and medium, type 10GBASE-PR (symmetric 10 Gb/s long wavelength passive optical networks) and 10/1GBASE-PRX (asymmetric 10 Gb/s downstream, 1 Gb/s upstream long wavelength passive optical networks), 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.

### 91.11.2 Identification

#### 91.11.2.1 Implementation identification

Supplier <sup>1</sup>	
Contact point for enquiries about the PICS <sup>1</sup>	
Implementation Name(s) and Version(s) <sup>1,3</sup>	
Other information necessary for full identification—e.g., name(s) and version(s) for machines and/or operating systems; System Name(s) <sup>2</sup>	
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).	

<sup>1</sup>Copyright release for PICS proformas: Users of this standard may freely reproduce the PICS proforma in this subclause so that it can be used for its intended purpose and may further publish the completed PICS.

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**91.11.2.2 Protocol Summary**

Identification of protocol standard	IEEE Std 802.3–2005, Clause 91, Physical Medium Dependent (PMD) sublayer and medium, type 10GBASE–PR (symmetric 10 Gb/s long wavelength passive optical networks) and 10/1GBASE–PRX (asymmetric 10 Gb/s downstream, 1 Gb/s upstream long wavelength passive optical networks)
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 802.3–2005.)	

Date of Statement	
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### 91.11.3 Major capabilities/options

Item	Feature	Subclause	Value/Comment	Status	Support
HT	High temperature operation	?TBD?	?TBD?	O	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
LT	Low temperature operation	?TBD?	?TBD?	O	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PR10U	10GBASE-PR-D1 or 10GBASE-PR-U1 PMD	91.4, 91.5	Device supports 10 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PR10D	10GBASE-PR-D1 or 10GBASE-PR-U1 PMD	91.4, 91.5	Device supports 10 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PR20U	10GBASE-PR-D2 or 10GBASE-PR-U1 PMD	91.4, 91.5	Device supports 20 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PR20D	10GBASE-PR-D2 or 10GBASE-PR-U1 PMD	91.4, 91.5	Device supports 20 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PR30U	10GBASE-PR-D3 or 10GBASE-PR-U3 PMD	91.4, 91.5	Device supports 20 km 1:32 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PR30D	10GBASE-PR-D3 or 10GBASE-PR-U3 PMD	91.4, 91.5	Device supports 20 km 1:32 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PRX10U	10/1GBASE-PRX-D1 or 10/1GBASE-PRX-U1 PMD	91.4, 91.5	Device supports 10 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PRX10D	10/1GBASE-PRX-D1 or 10/1GBASE-PRX-U1 PMD	91.4, 91.5	Device supports 10 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PRX20U	10/1GBASE-PRX-D2 or 10/1GBASE-PRX-U2 PMD	91.4, 91.5	Device supports 20 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PRX20D	10/1GBASE-PRX-D2 or 10/1GBASE-PRX-U2 PMD	91.4, 91.5	Device supports 20 km 1:16 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PRX30U	10/1GBASE-PRX-D3 or 10/1GBASE-PRX-U3 PMD	91.4, 91.5	Device supports 20 km 1:32 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*PRX30D	10/1GBASE-PRX-D3 or 10/1GBASE-PRX-U3 PMD	91.4, 91.5	Device supports 20 km 1:32 split	O/1	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>
*INS	Installation / Cable	91.3.1	Items marked with INS include installation practices and cable specifications not applicable to a PHY manufac- turer.	O	Yes [ <input type="checkbox"/> No [ <input type="checkbox"/>

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**91.11.4 PICS proforma tables for Physical Medium Dependent (PMD) sublayer and medium, type 10GBASE-PR (symmetric 10 Gb/s long wavelength passive optical networks) and 10/1GBASE-PRX (asymmetric 10 Gb/s downstream, 1 Gb/s upstream long wavelength passive optical networks)**

**91.11.4.1 PMD functional specifications**

Item	Feature	Subclause	Value/Comment	Status	Support
FN1	Transmit function	91.3.3	Conveys bits from PMD service interface to MDI	M	Yes [ ]
FN2	Transmitter optical signal	91.3.3	Higher optical power transmitted is a logic 1	M	Yes [ ]
FN3	Receive function	91.3.4	Conveys bits from MDI to PMD service interface	M	Yes [ ]
FN4	Receiver optical signal	91.3.4	Higher optical power received is a logic 1	M	Yes [ ]
FN5	Signal detect function	91.3.5.1	Mapping to PMD service interface	M	Yes [ ]
FN6	Signal detect parameter	91.3.5.1	Generated according to Table 91-4	M	Yes [ ]
FN7	Signal detect function	91.3.5.2	Mapping to PMD service interface	O/2	Yes [ ]
FN7	Signal detect function	91.3.5.2	Provided by higher layer	O/2	Yes [ ]
FN8	Signal detect parameter	91.2.4.1	Generated according to Table 91-4	O	Yes [ ]

**91.11.4.2 PMD to MDI optical specifications for 10GBASE-PR-D1**

Item	Feature	Subclause	Value/Comment	Status	Support
PRD1F1	10GBASE-PR-D1 transmitter	91.4.1	Meets specifications in Table 91-5	PRD1F1:M	Yes [ ] N/A [ ]
PRD1F2	10GBASE-PR-D1 receiver	91.4.2	Meets specifications in Table 91-6	PRD1F2:M	Yes [ ] N/A [ ]
PRD1F3	10GBASE-PR-D1 stressed receiver sensitivity	91.4.2	Meets specifications in Table 91-6	PRD1F3:O	Yes [ ] No [ ] N/A [ ]
PRD1F4	10GBASE-PR-D1 receiver damage threshold	91.4.2	If the receiver does not meet the damage requirements in Table 91-6 then label accordingly	PRD1F4:M	Yes [ ] N/A [ ]

**91.11.4.3 PMD to MDI optical specifications for 10GBASE-PR-D2**

Item	Feature	Subclause	Value/Comment	Status	Support
PRD2F1	10GBASE-PR-D2 transmitter	91.4.1	Meets specifications in Table 91-5	PRD2F1:M	Yes [ ] N/A [ ]
PRD2F2	10GBASE-PR-D2 receiver	91.4.2	Meets specifications in Table 91-6	PRD2F2:M	Yes [ ] N/A [ ]
PRD2F3	10GBASE-PR-D2 stressed receiver sensitivity	91.4.2	Meets specifications in Table 91-6	PRD2F3:O	Yes [ ] No [ ] N/A [ ]
PRD2F4	10GBASE-PR-D2 receiver damage threshold	91.4.2	If the receiver does not meet the damage requirements in Table 91-6 then label accordingly	PRD2F4:M	Yes [ ] N/A [ ]

**91.11.4.4 PMD to MDI optical specifications for 10GBASE-PR-D3**

Item	Feature	Subclause	Value/Comment	Status	Support
PRD3F1	10GBASE-PR-D3 transmitter	91.4.1	Meets specifications in Table 91-5	PRD3F1:M	Yes [ ] N/A [ ]
PRD3F2	10GBASE-PR-D3 receiver	91.4.2	Meets specifications in Table 91-6	PRD3F2:M	Yes [ ] N/A [ ]
PRD3F3	10GBASE-PR-D3 stressed receiver sensitivity	91.4.2	Meets specifications in Table 91-6	PRD3F3:O	Yes [ ] No [ ] N/A [ ]
PRD3F4	10GBASE-PR-D3 receiver damage threshold	91.4.2	If the receiver does not meet the damage requirements in Table 91-6 then label accordingly	PRD3F4:M	Yes [ ] N/A [ ]

**91.11.4.5 PMD to MDI optical specifications for 10/1GBASE-PRX-D1**

Item	Feature	Subclause	Value/Comment	Status	Support
PRXD1F1	10/1GBASE-PXR-D1 transmitter	91.4.1	Meets specifications in Table 91-5	PRXD1F1:M	Yes [ ] N/A [ ]
PRXD1F2	10/1GBASE-PRX-D1 receiver	91.4.2	Meets specifications in Table 91-7	PRXD1F2:M	Yes [ ] N/A [ ]
PRXD1F3	10/1GBASE-PRX-D1 stressed receiver sensitivity	91.4.2	Meets specifications in Table 91-7	PRXD1F3:O	Yes [ ] No [ ] N/A [ ]
PRXD1F4	10/1GBASE-PRX-D1 receiver damage threshold	91.4.2	If the receiver does not meet the damage requirements in Table 91-7 then label accordingly	PRXD1F4:M	Yes [ ] N/A [ ]

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**91.11.4.6 PMD to MDI optical specifications for 10/1GBASE-PRX-D2**

Item	Feature	Subclause	Value/Comment	Status	Support
PRXD2F1	10/1GBASE-PXR-D2 transmitter	91.4.1	Meets specifications in Table 91-5	PRXD2F1:M	Yes [ ] N/A [ ]
PRXD2F2	10/1GBASE-PRX-D2 receiver	91.4.2	Meets specifications in Table 91-7	PRXD2F2:M	Yes [ ] N/A [ ]
PRXD2F3	10/1GBASE-PRX-D2 stressed receiver sensitivity	91.4.2	Meets specifications in Table 91-7	PRXD2F3:O	Yes [ ] No [ ] N/A [ ]
PRXD2F4	10/1GBASE-PRX-D2 receiver damage threshold	91.4.2	If the receiver does not meet the damage requirements in Table 91-7 then label accordingly	PRXD2F4:M	Yes [ ] N/A [ ]

**91.11.4.7 PMD to MDI optical specifications for 10/1GBASE-PRX-D3**

Item	Feature	Subclause	Value/Comment	Status	Support
PRXD3F1	10/1GBASE-PXR-D3 transmitter	91.4.1	Meets specifications in Table 91-5	PRXD3F1:M	Yes [ ] N/A [ ]
PRXD3F2	10/1GBASE-PRX-D3 receiver	91.4.2	Meets specifications in Table 91-7	PRXD3F2:M	Yes [ ] N/A [ ]
PRXD3F3	10/1GBASE-PRX-D3 stressed receiver sensitivity	91.4.2	Meets specifications in Table 91-7	PRXD3F3:O	Yes [ ] No [ ] N/A [ ]
PRXD3F4	10/1GBASE-PRX-D3 receiver damage threshold	91.4.2	If the receiver does not meet the damage requirements in Table 91-7 then label accordingly	PRXD3F4:M	Yes [ ] N/A [ ]

**91.11.4.8 PMD to MDI optical specifications for 10GBASE-PR-U1**

Item	Feature	Subclause	Value/Comment	Status	Support
PRU1F1	10GBASE-PR-U1 transmitter	91.5.1	Meets specifications in Table 91-8	PRU1F1:M	Yes [ ] N/A [ ]
PRU1F2	10GBASE-PR-U1 receiver	91.5.2	Meets specifications in Table 91-11	PRU1F2:M	Yes [ ] N/A [ ]
PRU1F3	10GBASE-PR-U1 stressed receiver sensitivity	91.5.2	Meets specifications in Table 91-11	PRU1F3:O	Yes [ ] No [ ] N/A [ ]
PRU1F4	10GBASE-PR-U1 receiver damage threshold	91.5.2	If the receiver does not meet the damage requirements in Table 91-11 then label accordingly	PRU1F4:M	Yes [ ] N/A [ ]

**91.11.4.9 PMD to MDI optical specifications for 10GBASE-PR-U3**

Item	Feature	Subclause	Value/Comment	Status	Support
PRU3F1	10GBASE-PR-U3 transmitter	91.5.1	Meets specifications in Table 91-8	PRU3F1:M	Yes [ ] N/A [ ]
PRU3F2	10GBASE-PR-U3 receiver	91.5.2	Meets specifications in Table 91-11	PRU3F2:M	Yes [ ] N/A [ ]
PRU3F3	10GBASE-PR-U3 stressed receiver sensitivity	91.5.2	Meets specifications in Table 91-11	PRU3F3:O	Yes [ ] No [ ] N/A [ ]
PRU3F4	10GBASE-PR-U3 receiver damage threshold	91.5.2	If the receiver does not meet the damage requirements in Table 91-11 then label accordingly	PRU3F4:M	Yes [ ] N/A [ ]

**91.11.4.10 PMD to MDI optical specifications for 10/1GBASE-PRX-U1**

Item	Feature	Subclause	Value/Comment	Status	Support
PRXU1F1	10/1GBASE-PRX-U1 transmitter	91.5.1	Meets specifications in Table 91-9	PRXU1F1:M	Yes [ ] N/A [ ]
PRXU1F2	10/1GBASE-PRX-U1 receiver	91.5.2	Meets specifications in Table 91-11	PRXU1F2:M	Yes [ ] N/A [ ]
PRXU1F3	10/1GBASE-PRX-U1 stressed receiver sensitivity	91.5.2	Meets specifications in Table 91-11	PRXU1F3:O	Yes [ ] No [ ] N/A [ ]
PRXU1F4	10/1GBASE-PRX-U1 receiver damage threshold	91.5.2	If the receiver does not meet the damage requirements in Table 91-11 then label accordingly	PRXU1F4:M	Yes [ ] N/A [ ]

**91.11.4.11 PMD to MDI optical specifications for 10/1GBASE-PRX-U2**

Item	Feature	Subclause	Value/Comment	Status	Support
PRXU2F1	10/1GBASE-PRX-U2 transmitter	91.5.1	Meets specifications in Table 91-9	PRXU2F1:M	Yes [ ] N/A [ ]
PRXU2F2	10/1GBASE-PRX-U2 receiver	91.5.2	Meets specifications in Table 91-11	PRXU2F2:M	Yes [ ] N/A [ ]
PRXU2F3	10/1GBASE-PRX-U2 stressed receiver sensitivity	91.5.2	Meets specifications in Table 91-11	PRXU2F3:O	Yes [ ] No [ ] N/A [ ]
PRXU2F4	10/1GBASE-PRX-U2 receiver damage threshold	91.5.2	If the receiver does not meet the damage requirements in Table 91-11 then label accordingly	PRXU2F4:M	Yes [ ] N/A [ ]

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**91.11.4.12 PMD to MDI optical specifications for 10/1GBASE-PRX-U3**

Item	Feature	Subclause	Value/Comment	Status	Support
PRXU3F1	10/1GBASE-PRX-U3 transmitter	91.5.1	Meets specifications in Table 91-9	PRXU3F1:M	Yes [ ] N/A [ ]
PRXU3F2	10/1GBASE-PRX-U3 receiver	91.5.2	Meets specifications in Table 91-11	PRXU3F2:M	Yes [ ] N/A [ ]
PRXU3F3	10/1GBASE-PRX-U3 stressed receiver sensitivity	91.5.2	Meets specifications in Table 91-11	PRXU3F3:O	Yes [ ] No [ ] N/A [ ]
PRXU3F4	10/1GBASE-PRX-U3 receiver damage threshold	91.5.2	If the receiver does not meet the damage requirements in Table 91-11 then label accordingly	PRXU3F4:M	Yes [ ] N/A [ ]

**91.11.4.13 Optical measurement requirements**

Item	Feature	Subclause	Value/Comment	Status	Support
OM1	Measurement cable	?TBD?	2 m to 5 meters in length	M	Yes [ ]
OM2	Wavelength and spectral width measurement	?TBD?	Per TIA/EIA-455-127 under modulated conditions	M	Yes [ ]
OM3	Average optical power	?TBD?	Per TIA/EIA-455-95	M	Yes [ ]
OM4	Extinction ratio	?TBD?	Per ANSI/TIA/EIA-526-4A with minimal back reflections and fourth-order Bessel-Thomson receiver	M	Yes [ ]
OM5	RIN <sub>15</sub> OMA	?TBD?	As described in 58.8.7	M	Yes [ ]
OM6	Transmit optical waveform (transmit eye)	?TBD?	Per ANSI/TIA/EIA-526-4A with test pattern and fourth-order Bessel-Thomson receiver	M	Yes [ ]
OM7	Transmitter and dispersion penalty measurements	?TBD?	As described in 58.7.9	M	Yes [ ]
OM8	Receive sensitivity	?TBD?	With specified pattern	M	Yes [ ]
*OM9	Stressed receiver conformance test	?TBD?	As described in ?TBD?	O	Yes [ ] N/A [ ]



#### 91.11.4.14 Characteristics of the fiber optic cabling and MDI

Item	Feature	Subclause	Value/Comment	Status	Support
FO1	Fiber optic cabling	91.10	Specified in Table 91–14	INS:M	Yes [ ] N/A [ ]
F02	End –to–end channel loss	91.10	Meeting the requirements of Table 91–1 and Table 91–2	INS:M	Yes [ ] N/A [ ]
FO3	Maximum discrete reflectance – single–mode fiber	91.10.3	Less than –26 dB	INS:M	Yes [ ] N/A [ ]
FO4	MDI requirements	91.10.4	Meet the interface performance specifications of IEC 61753–1, if remateable	INS:O	Yes [ ] No [ ] N/A [ ]

#### 91.11.4.15 Environmental specifications

Item	Feature	Subclause	Value/Comment	Status	Support
ES1	General safety	91.9.1	Conforms to IEC–60950	M	Yes [ ]
ES2	Laser safety —IEC Class 1	91.9.1	Conform to Class 1 laser requirements defined in IEC 60825–1	M	Yes [ ]
ES3	Documentation	91.9.1	Explicitly defines requirements and usage restrictions to meet safety certifications	M	Yes [ ]
ES4	Operating temperature range labeling	91.9.4	If required	M	Yes [ ] N/A [ ]

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