

Editor's Note: where possible cross reference material already in the standard rather than duplicate content.

Color Key: Dark red font Editors Note's (my opinion only)

Green Font – no significant change (mostly editorial)

Blue font – some changes may be required (more than just PMD names)

Magenta Font – significant changes needed

1. Introduction	6
1.3 Normative references	6
1.4 Definitions	6
1.5 Abbreviations	6
30. Management	7
<i>Editor's Note: detailed changes needed in Cl 30 have not been investigated yet.</i>	
45. Management Data Input/Output (MDIO) Interface	7
<i>Editor's Note: detailed changes needed in Cl 45 have not been investigated yet (the following is copied from the WG Template).</i>	
45.2 MDIO Interface Registers	7
45.2.1 PMA/PMD registers	7
45.2.1.93a <Insert name 1> register (Register 1.xxx)	7
45.2.1.93a.1 <Bit name 1> (1.xxx.2)	7
45.2.1.93a.2 <Bits name 2> (1.xxx.1:0)	8
45.2.1.93b <Insert name 2> register (Register 1.yyy)	8
45.2.1.93b.1 <Bit name 3> (1.yyy.2)	8
45.2.1.93b.2 <Bits name 4> (1.yyy.1:0)	8
<i>Editor's Note: detailed changes to Cl 56 are in a separate contribution.</i>	
56. Introduction to Ethernet for subscriber access networks	6
56.1 Overview	7
56.1.1 Summary of P2P sublayers	7
56.1.1.1 P2P fiber media	8
56.1.1.2 P2P copper media	8
56.1.1.3 Physical Layer signaling systems	8
56.1.1.5 Unidirectional transmission	8

Editors Note: this 10G Clause is modeled after Cl 52.

200. Physical Medium Dependent (PMD) sublayer and medium, types @PMD-S@, @PMD-L@, and @PMD-E@	9
200.1 Overview	9
200.1.1 PMD sublayer service interface	10
200.1.1.1 PMD_UNITDATA.request	11
200.1.1.1.1 Semantics of the service primitive	11
200.1.1.1.2 When generated	11
200.1.1.1.3 Effect of receipt	11
200.1.1.2 PMD_UNITDATA.indication	11
200.1.1.2.1 Semantics of the service primitive	11
200.1.1.2.2 When generated	11
200.1.1.2.3 Effect of receipt	11
200.1.1.3 PMD_SIGNAL.indication	12
200.1.1.3.1 Semantics of the service primitive	12
200.1.1.3.2 When generated	12
200.1.1.3.3 Effect of receipt	12
200.2 Delay constraints	12
200.3 PMD MDIO function mapping	12
200.4 PMD functional specifications	13
200.4.1 PMD block diagram.	13
200.4.2 PMD transmit function	14
200.4.3 PMD receive function	14
200.4.4 PMD signal detect function	14
200.4.5 PMD reset function	14
200.4.6 PMD fault function	15
200.4.7 PMD global transmit disable function	15
200.4.8 PMD transmit fault function	15
200.4.9 PMD receive fault function	15
200.5 PMD to MDI optical specifications for @PMD-S@	15
<i>Editor's Note: The lion's share of the work in 10G BiDi will be in section 5. We should consider combining all PMDs into a single clause as is done in 114 and 139 rather than use separate sections for each PMD.</i>	
200.5.1 10GBASE-S transmitter optical specifications	16
200.5.2 10GBASE-S receiver optical specifications	17
200.5.3 10GBASE-S link power budgets (informative)	19
200.6 PMD to MDI optical specifications for @PMD-L@	20
200.6.1 @PMD-L@ transmitter optical specifications	20
200.6.2 @PMD-L@ receive optical specifications	21
200.6.3 52.6.3 @PMD-L@ link power budgets (informative)	22
200.7 PMD to MDI optical specifications for (PMD3 name)	22
200.7.1 @PMD-E@ transmitter optical specifications	23
200.7.2 @PMD-E@ receive optical specifications	23
200.7.3 @PMD-E@ link power budgets (informative)	24
200.8 Jitter specifications for @PMD-R@ and @PMD-W@	24
200.8.1 Sinusoidal jitter for receiver conformance test	25

200.9	Optical measurement requirements	26
	<i>Editor's Note: Section 200.9 (and 201.7 and 202.7) may largely be usable without change with the obvious exceptions of BiDi PMD names and the differences due to single fiber vs dual fiber.</i>	
200.9.1	Test patterns	26
200.9.1.1	Test-pattern definition	26
200.9.1.2	Square wave pattern definition	28
200.9.2	Center wavelength, spectral width, and side mode suppression ratio (SMSR) measurements	28
200.9.3	Average optical power measurements	28
200.9.4	Extinction ratio measurements	28
200.9.5	Optical modulation amplitude (OMA) test procedure	28
200.9.6	Relative intensity noise optical modulation amplitude (RINxOMA) measuring procedure	29
200.9.7	Transmitter optical waveform	29
200.9.8	Receive sensitivity measurements	31
200.9.9	Stressed receiver conformance test	31
200.9.10	Transmitter and dispersion penalty (TDP)	32
200.9.10.1	Reference transmitter requirements	32
200.9.10.2	Channel requirements	32
200.9.10.3	Reference receiver requirements	33
200.9.10.4	Test procedure	34
200.9.11	Measurement of the receiver 3 dB electrical upper cutoff frequency	34
200.10	Environmental specifications	35
200.10.1	General safety	35
200.10.2	Laser safety	35
200.10.3	Installation	36
200.11	Environment	36
200.11.1	Electromagnetic emission	36
200.11.2	Temperature, humidity, and handling	36
	<i>Editor's Note: we might consider referencing 59.8.4 Environment for temp spec</i>	
200.12	PMD labeling requirements	36
200.13	Fiber optic cabling model	36
200.14	Characteristics of the fiber optic cabling (channel)	38
200.14.1	Optical fiber and cable	38
200.14.2	Optical fiber connection	38
200.14.2.1	Connection insertion loss	38
200.14.2.2	Maximum discrete reflectance	39
200.14.3	@PMD-E@ attenuator management	40
200.14.4	Medium Dependent Interface (MDI) requirements	40
200.15	Protocol implementation conformance statement (PICS) proforma for Clause 200, clause title	41
200.15.1	Introduction	41
200.15.2	Identification	42
200.15.2.1	Implementation identification	42
200.15.2.2	Protocol summary	42
200.15.3	Major capabilities/options	43
200.15.4	PICS proforma tables for clause title	43
200.15.4.1	PMD functional specifications	43
200.15.4.2	Management functions	43

Editors Note: this 25G Clause is modeled after CI 114

201. Physical Medium Dependent (PMD) sublayer and medium, types (25G PMD name list)	16
201.1 Overview	16
201.1.1 Bit error ratio	17
201.2 Physical Medium Dependent (PMD) service interface	18
201.3 Delay constraints	18
201.4 PMD MDIO function mapping	18
201.5 PMD functional specifications	19
201.5.1 PMD block diagram	19
201.5.2 PMD transmit function	19
201.5.3 PMD receive function	19
201.5.4 PMD global signal detect function	20
201.5.5 PMD reset function	20
201.5.6 PMD global transmit disable function (optional)	20
201.5.7 PMD fault function (optional)	21
201.5.8 PMD transmit fault function (optional)	21
201.5.9 PMD receive fault function (optional)	21
201.6 PMD to MDI optical specifications for @PMD-LR, PMD2, and PMD-ER@	21
<i>Editor's Note: The lion's share of the work in 50G BiDi will be in section 6.</i>	
201.6.1 @PMD-LR, PMD2, and PMD-ER@ transmitter optical specifications	22
201.6.2 @PMD-LR, PMD2, and PMD-ER@ receiver optical specifications	22
201.6.3 @PMD-LR, PMD2, and PMD-ER@ illustrative link power budgets	23
201.7 Definition of optical parameters and measurement methods	24
201.7.1 Test patterns for optical parameters	24
201.7.2 Wavelength and side mode suppression ratio (SMSR)	24
201.7.3 Average optical power	25
201.7.4 Optical modulation amplitude (OMA)	25
201.7.5 Transmitter and dispersion penalty (TDP)	25
201.7.5.1 Reference transmitter requirements	25
201.7.5.2 Channel requirements	26
201.7.5.3 Reference receiver requirements	26
201.7.5.4 Test procedure	26
201.7.6 Extinction ratio	26
201.7.7 Relative intensity noise optical (RIN20OMA)	26
201.7.8 Transmitter optical waveform (transmit eye)	26
201.7.9 Receive sensitivity	27
201.7.10 Stressed receiver sensitivity	27
201.8 Safety, installation, environment, and labeling	27
<i>Editor's Note: We should consider just ref another clause as was done in 114.</i>	
201.9 Fiber optic cabling model	27
201.10 Characteristics of the fiber optic cabling (channel)	29
201.11 Requirements for interoperation @PMD-LR, PMD2 and PMD-ER@	29
<i>Editor's Note: may not be needed for BiDi?</i>	

201.12	Protocol implementation conformance statement (PICS) proforma for Clause 201, clause title	31
201.12.1	Introduction	31
201.12.2	Identification	31
201.12.2.1	Implementation identification	31
201.12.2.2	Protocol summary	31
201.12.3	Major capabilities/options	32
201.12.4	PICS proforma tables for clause title	32
201.12.4.1	PMD functional specifications	32
201.12.4.2	Management functions	32

Editors Note: this 50G Clause is modeled after CI 139 Draft 3.5

202.	Physical Medium Dependent (PMD) sublayer and medium, types (50G PMD name list)	22
202.1	Overview	23
202.1.1	Bit error ratio	23
202.2	Physical Medium Dependent (PMD) service interface	23
202.3	Delay and Skew	23
202.3.1	Delay constraints	23
202.3.2	Skew constraints	23
202.4	PMD MDIO function mapping	23
202.5	PMD functional specifications	23
202.5.1	PMD block diagram	23
202.5.2	PMD transmit function	23
202.5.3	PMD receive function	23
202.5.4	PMD global signal detect function	23
202.5.5	PMD reset function	23
202.5.6	PMD global transmit disable function (optional)	23
202.5.7	PMD fault function (optional)	23
202.5.8	PMD transmit fault function (optional)	23
202.5.9	PMD receive fault function (optional)	23
202.6	PMD to MDI optical specifications for (PMD name list)	23
	<i>Editor's Note: The lion's share of the work in 50G BiDi will be in section 6.</i>	
202.6.1	(PMD name list) transmitter optical specifications	23
202.6.2	(PMD name list) receiver optical specifications	23
202.6.3	(PMD name list) illustrative link power budgets	23
202.7	Definition of optical parameters and measurement methods	23
202.7.1	Test patterns optical parameters	23
202.7.2	Wavelength and side mode suppression ratio (SMSR)	24
202.7.3	Average optical power	24
202.7.4	Outer Optical Modulation Amplitude (OMA _{outer})	24
202.7.5	Transmitter and dispersion eye closure for PAM4 (TDECQ)	24
202.7.6	Extinction ratio measurements	24
202.7.7	Transmitter transition time	24
202.7.8	Relative intensity noise (RIN _{17.1OMA} and RIN _{15.6OMA})	24
202.7.9	Receive sensitivity	24
202.7.10	Stressed receiver sensitivity	24

202.8	Safety, installation, environment, and labeling	24
	<i>Editor's Note: We should consider just ref another clause as was done in 114.</i>	
202.8.1	General safety	24
202.8.2	Laser safety	24
202.8.3	Installation	24
202.8.4	Environment	24
202.8.5	Electromagnetic emission	24
202.8.6	Temperature, humidity, and handling	24
202.8.7	PMD labeling requirements	24
202.9	Fiber optic cabling model	24
202.10	Characteristics of the fiber optic cabling	24
202.10.1	Optical fiber cable	24
202.10.2	Optical fiber connection	24
202.10.3	Medium Dependent Interface (MDI) requirements	24
202.11	Protocol implementation conformance statement (PICS) proforma for	
	Clause 202, clause title	25
202.11.1	Introduction	25
202.11.2	Identification	26
202.11.2.1	Implementation identification	26
202.11.2.2	Protocol summary	26
202.11.3	Major capabilities/options	27
202.11.4	PICS proforma tables for clause title	27
202.11.4.1	PMD functional specifications	27
202.11.4.2	Management functions	27