

IEEE 802.3 Ethernet Working Group Liaison Communication

Source: IEEE 802.3 Working Group¹

To: Antonio Castano Chair, SDM4 MCF MSA
antonio.castano@aflglobal.com

CC: Alpesh Shah Secretary, IEEE-SA Standards Board
Secretary, IEEE-SA Board of Governors
sasecretary@ieee.org

James Gilb Chair, IEEE 802 LMSC
gilb_ieee@tuta.com

Adam Healey Vice-chair, IEEE 802.3 Ethernet Working Group
adam.healey@broadcom.com

Jon Lewis Secretary, IEEE 802.3 Ethernet Working Group
Chair, IEEE 802.3 NEA Ad hoc
jon.lewis@dell.com

John D'Ambrosia Chair, IEEE 802.3 NEA "E4AI" Assessment
jdambrosia@ieee.org

From: David Law Chair, IEEE 802.3 Ethernet Working Group
dlaw@hpe.com

Subject: Request for Information related to Multi-Core Fibre (MCF)

Approval Agreed at IEEE 802.3 Interim meeting, Lisbon, Portugal, 17 September 2026

Dear Mr Castano and members of the SDM4 MCF MSA,

Over the past two years, the IEEE 802.3 Ethernet Working Group (WG) has assessed back-end AI networks to understand what potential future Ethernet solutions may be required. This work has been undertaken in the IEEE 802.3 Industry Connections New Ethernet Applications (NEA) Ad Hoc "Ethernet for AI" Assessment (E4AI). Further information is available at: https://www.ieee802.org/3/ad_hoc/E4AI/index.html.

During the course of these discussions, we discussed potential use cases for multi-core fibre. Conversations have focused on fibre specifications, connector requirements, and the need for the development of a normative optical channel model, which would be the basis for the development of any optical Ethernet Physical Layer device (PHY). Currently, the IEEE 802.3 WG is not aware of the availability of any of these items, but we are aware of relevant standardisation activities underway in ITU-T SG 15 and IEC addressing fibre and connector specifications.

To facilitate increased broader industry discussion in these general areas, the IEEE 802.3 NEA E4AI Assessment has announced it will hold two workshops that are open to all and have

¹ This document solely represents the views of the IEEE 802.3 Working Group and does not necessarily represent a position of the IEEE, the IEEE Standards Association, or IEEE 802.

no registration fee:

- “Next Generation Fiber Optic Connector” Workshop

3 December 2026, 15:00 to 19:00 UTC

Announcement: https://www.ieee802.org/3/ad_hoc/E4AI/email/msg00136.html

Agenda: explore next-generation fibre optic connector issues. The workshop will be limited to presentations and contributions submitted by Standards Development Organisations (SDOs) and industry organisations regarding:

- Generic/basic information about polarity and connector
 - New connector interface types, such as 2-row Multi-fibre Push-On (MPO), Very Small Form Factor (VSFF), or connectors targeting Multi-core Fiber (MCF)
 - Standardization of the MCF connector with the MPO interface and polarity
 - Next generation connector performance assumptions used for optical channel development.
 - Other issues
- 2nd "Fiber for AI" Workshop
- 9 February 2027, 14:00 to 18:00 UTC
- Announcement: https://www.ieee802.org/3/ad_hoc/E4AI/email/msg00146.html
- Agenda: explore the future of fibre, with an emphasis on 400 Gb/s signalling and beyond. Potential topics include future single mode fibre (SMF) and multimode fibre (MMF) developments, multicore fibre, hollow core fibre, etc.

We would like to encourage your organisation and its members to consider participation in these two workshops, and to address the following issues that would enable the development of a specification of an Ethernet PHY for operation on MCF:

- MCF optical fibre and cable characteristics, including fibre attenuation, chromatic dispersion, polarization mode dispersion (PMD) and differential group delay (DGD).
- Optical insertion loss and reflection characteristics for optical MCF connectors will need to be defined.
- It is anticipated that MCF will introduce crosstalk between fibre cores or at any connectors, which will introduce new additional penalties in an optical link power budget. Limits for core-to-core crosstalk in both the forward propagation direction and the reverse propagation direction from connector reflections would need to be defined.
- Specifications defining the physical characteristics of any optical connectors that could be normatively referenced for the associated Ethernet PHY would need to be identified.
- Alternatively, if SMF connectors with external fibre fanouts to MCF were used, it would be necessary to understand the optical insertion loss, reflection, and crosstalk characteristics of these elements when used as part of the optical channel.

We look forward to interaction with your organization as the potential future of multi-core fibre for Ethernet solutions is explored.

Sincerely,
David Law
Chair, IEEE 802.3 Ethernet Working Group