

IEEE 802.3 Ethernet Working Group
DRAFT Liaison Communication

Source: IEEE 802.3 Working Group¹

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John D'Ambrosia Chair, IEEE 802.3 NEA "E4AI" Assessment
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From: David Law Chair, IEEE 802.3 Ethernet Working Group
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Subject: Request for Information related to Multi-Core Fiber (MCF)

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

Dear Antonio and members of the SDM4 MCF MSA,

Over the past two years, the IEEE 802.3 Ethernet Working Group has been assessing back-end AI networks to understand what potential future Ethernet solutions may be required. This work has been undertaken in the IEEE 802.3 NEA "Ethernet for AI" Assessment (E4AI). See https://www.ieee802.org/3/ad_hoc/E4AI/index.html.

During the course of these discussions, potential use cases for multi-core fiber have been explored. Conversations have focused on the fiber specifications, connector requirements, and the need for the development of a normative optical channel model. (The normative optical channel model is significant to IEEE 802.3, as it is the basis for the development of any optical Ethernet PMDs.) At this time IEEE 802.3 is not aware of the availability of any of these items, but we are aware of relevant standardization activities underway in ITU-T SG 15 and IEC addressing fiber and connector specifications.

To facilitate increased broader industry discussion in these general areas, the IEEE 802.3 NEA E4AI Assessment has announced it will be holding two workshops that will be open to all with no registration fees –

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.

- “Next Generation Fiber Optic Connector” Workshop

03 Dec 2026, 10am to 2pm, ET

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

Agenda - explore next-generation fiber optic connector issues. The workshop will be limited to presentations and contributions submitted by SDO's and industry organizations regarding –

- Generic/basic information about polarity and connector
- How new connector interface types (2-row Multi-fiber Push-On (MPO), Very Small Form Factor (VSFF) and Multi-core Fiber (MCF)) are more complicated than existing connectors
- 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

09 Feb 2027 (9am to 1pm ET)

Announcement - https://www.ieee802.org/3/ad_hoc/E4AI/email/msg00146.html

Agenda - explore the future of fiber, with an emphasis on 400 Gb/s signaling and beyond. Potential topics include future SMF and MMF developments, multicore fiber, hollow core fiber, etc.

We would like to encourage your organization and its members to consider participation in these two workshops. The following is a list of technical input regarding MCF that would be necessary for the development of an optical PMD:

- MCF optical fiber and cable characteristics, including fiber attenuation, chromatic dispersion and PMD/DGD must be defined.
- MCF optical connector insertion loss and reflection characteristics must be defined in order for 802.3 to specify the maximum insertion loss and optical return loss of the optical channel.
- It is anticipated that MCF will introduce crosstalk between fiber cores which will introduce new additional penalties in the link power budget. Limits for core-to-core crosstalk in both the forward propagation direction and the reverse propagation direction from connector reflections must be defined.
- Optionally, in order to define MCF MDIs for use in future 802.3 PMDs, the physical characteristics of MCF optical connectors must be defined. The alternative will be to use SMF MDIs with external fiber fanouts to MCF, in which case it will be necessary to understand the optical insertion loss, reflection, and crosstalk characteristics of these elements which then form part of the optical channel.

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

Sincerely,

David Law

Chair, IEEE 802.3 Ethernet Working Group