

Reach Objectives for 850 nm Links

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IEEE 802.3 200 Gb/s per Wavelength MMF PHYs Study Group
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Supporters

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Overview

Contribution in support of

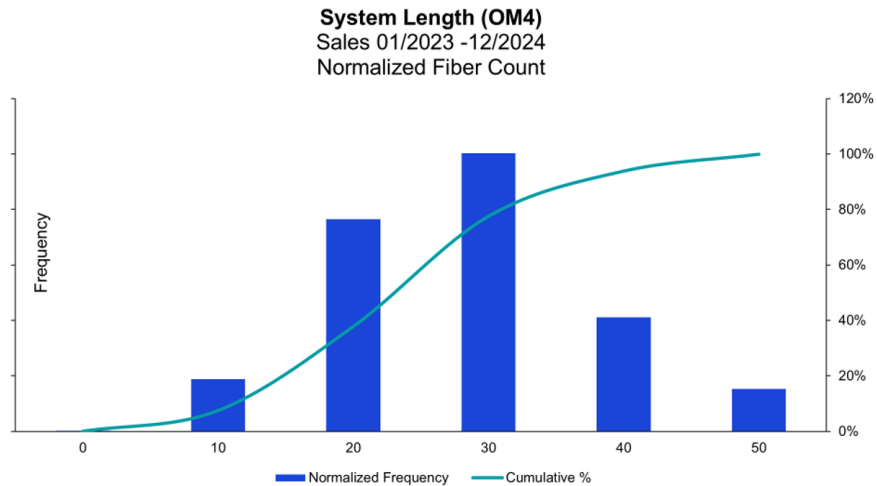
- Objectives for 200 Gb/s operation over 30 m and 50 m MMF
- CSD
 - Broad Market Potential
 - Technical Feasibility
 - Economic Feasibility

Reach 30 m

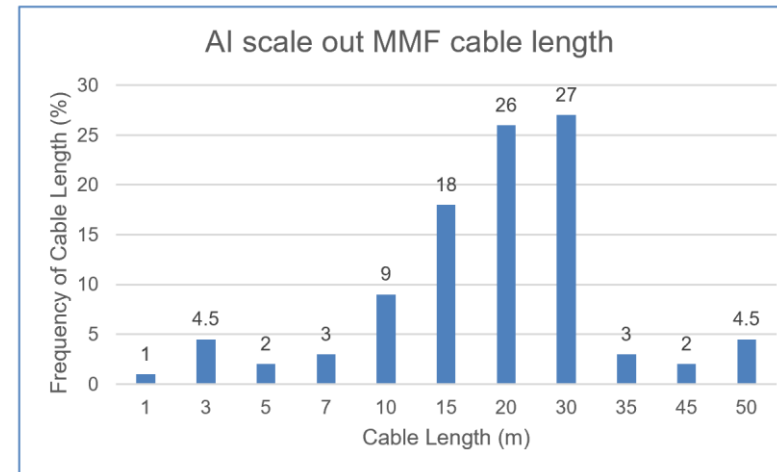
- A must hit target backed by broad end-user support and proven technical feasibility
- Multiple demonstrations indicate this can be realized on OM4 MMF
[CFI_200GMMF_R4_250717](#)
[bernier_200gmmf_adhoc_01a_250904](#)
- OM4 fiber -3 dBe bandwidth exceeds 60 GHz for RMS spectral width below 0.6 nm

Reach 50 m

- Interest in 50 m reach expressed by nearly all system vendors and end users at the CFI
- Distributions of link lengths show interconnects beyond 30 m that can be served by multimode links
[CFI_200GMMF_R4_250717](#)



- 30m OM4 reach covers 78% of data center links
- 50m OM4 reach covers 100% of data center links
- Average OM4: ~28m



- AI scale out, xPU to switch, MMF cable length
- 90.5% $\leq$ 30 m
- 100% $\leq$ 50 m
- Chart data represents many thousands of MMF links
- Timeframe: 2024
- OM3/OM4 (predominantly OM4)

Howard Trieu and Mabud Choudhury, Lightera

Vince Ferretti and Angela Lambert, Corning

Reach 50 m (2)

- Approach to 50 m reach: Combine a MMF with higher EMB than OM4 with some restriction on source RMS spectral width
This was outlined in [murty_200gmmf_adhoc_01a_250904](#)

- Will including the 50 m objective cause a delay?
 - A fiber other than OM3/OM4/OM5 requires standardization in IEC
 - The higher EMB MMF being pursued is a higher-grade fiber, not a new fiber, and should face an easier path to standardization
 - The 802.3 project pursued by this Study Group is expected to take about 2 years to complete
Recent projects of similar scope:

802.3db	32 months
802.3cu	25 months
 - Fiber standardization in IEC is feasible within the time frame of this project
- Specifications for 50 m reach can be written on the same timeline as 30 m reach

Recommended Objectives

Define a physical layer specification that supports 200 Gb/s operation:

- over 1 pair of MMF with lengths up to at least 30 m
- over 1 pair of MMF with lengths up to at least 50 m

Define a physical layer specification that supports 400 Gb/s operation:

- over 2 pairs of MMF with lengths up to at least 30 m
- over 2 pairs of MMF with lengths up to at least 50 m

Define a physical layer specification that supports 800 Gb/s operation:

- over 4 pairs of MMF with lengths up to at least 30 m
- over 4 pairs of MMF with lengths up to at least 50 m

Define a physical layer specification that supports 1.6 Tb/s operation:

- over 8 pairs of MMF with lengths up to at least 30 m
- over 8 pairs of MMF with lengths up to at least 50 m