

# Simplifying the Selection of Optical Multi-Mode Fibre

The volume of data passing over corporate networks has increased at a staggering rate over recent years. Technology has become a vital part of everyday business life and investment in these systems has therefore also grown at a similar pace.

Developments in technology such as desktop virtualization and unified communication tools have placed further strain on the network, and increased the importance of data cabling as part of the wider ecosystem that impacts the end user.

IT cabling, be it copper or fibre, tends to evolve with the new hardware being produced, and it is important that sufficient focus is placed on the choice of cabling as part of a well rounded IT solution.

## Recognise the significance of your cabling choices

Choosing the correct fibre optic cabling will ensure that you get the best possible performance from your IT infrastructure, providing users with fast access to the large amounts of data they need. This in turn maximizes the productivity and effectiveness of the workforce.

Failure to give proportionate attention to network cabling will hamper performance and ultimately undermine investments that have been made elsewhere.

The international standard ISO 11801 specifies four main classes of multi-mode optical fibre interconnect based on the modal bandwidth, which has helped to simplify the process for choosing the appropriate cabling.

- OM1 – 62.5µm core; 200 MHz-km @ 850nm
- OM2 – 50µm; 500 MHz-km @ 850nm
- OM3 – 50µm; 1500 MHz-km @ 850nm
- OM4 – 50µm; 3500 MHz-km @ 850nm

The differing bandwidths of these cables allow high network speeds to be maintained over longer transmission distances.





Category	Minimum <a href="#">modal bandwidth</a> 850 nm / 1310 nm <sup>[10]</sup>	100 Mb Ethernet 100BASE-FX	1 Gb (1000 Mb) Ethernet 1000BASE-SX	10 Gb Ethernet 10GBASE- SR	40 Gb Ethernet	100 Gb Ethernet
OM1 (62.5/125)	200 / 500 MHz·km	up to 2000 meters (FX) <sup>[11]</sup>	275 meters (SX) <sup>[11]</sup>	33 meters (SR) <sup>[11]</sup>	Not supported	Not supported
OM2 (50/125)	500 / – MHz·km	up to 2000 meters (FX) <sup>[11]</sup>	550 meters (SX) <sup>[2]</sup>	82 meters (SR) <sup>[2]</sup>	Not supported	Not supported
OM3 (50/125) *Laser Optimized*	1500 / 2000 MHz·km	up to 2000 meters (FX)	550 meters (SX)	300 meters (SR) <sup>[11]</sup>	100 meters <sup>[2]</sup> 330 meters QSFP+ eSR4 <sup>[12]</sup>	100 meters <sup>[2]</sup>
OM4 (50/125) *Laser Optimized*	3500 / 4700 MHz·km	up to 2000 meters (FX)	1000 meters (SX) <sup>[2]</sup>	400 meters (SR) <sup>[13]</sup>	150 meters <sup>[2]</sup> 550 meters QSFP+ eSR4 <sup>[12]</sup>	150 meters <sup>[2]</sup>

For instance, the industry standard minimum reach for OM3 cable at 10 Gbit/s speed is 300m. While OM1 is capable of supporting similar speeds, this only holds true over short distances. OM4 however can maintain it over an even longer distance (550m).

OM1 is therefore more widely used at the slower speed of 1 Gbit/s, which supports a transmission reach of 275m.

In the past, people were content with the 1 Gbit/s speeds that were possible with OM1, but in more and more cases this is no longer sufficient.

In our experience working with a range of clients, we are finding more people wanting to upgrade from OM1 to the laser-optimized OM3 to facilitate faster network speeds and greater bandwidth.



## **Performance vs. Distance vs. Cost**

The decision as to which optical multi-mode cable to choose ultimately comes down to a question of performance requirements, distance and cost.

The ISO 11801 classifications have greatly simplified this decision making process, defining an industry minimum standard reach for varying levels of performance.

OM3 is becoming the norm to achieve a 10 Gbit/s network, suitable if you require consistently high speeds to support a range of IP based technologies across your site.

If you are unsure which cabling solution is right for you, NM Cabling offers a free network survey, which includes expert advice on your options for installing, upgrading or growing your existing network.

**More information from NM Cabling Solutions 01923 888588**