

## ***Fault Finding in Fibre Optic Systems Without Instruments***

This short applications note outlines how to diagnose faults within the fibre optic parts of a system without recourse to instruments. A system will generally contain a driving / receiving device at each end, with patch cables and a main fibre optic link. Patch cables may not be used on some systems. Ethernet 802.3 fibre systems always transmit an idle signal if data is not present. This is approximately 1MHz and a 50/50 mark space ratio. Most equipment's have a link indicator to detect this. If the link indicator is on then it is almost a certainty the link is OK and is capable of transmitting data. Some manufactures have a light loss indicator instead, this is simply the inverse of LINK. Should the LINK indicator be off then adopt the following procedure.

- 1. Are both units powered?. Correct if necessary. Ensure externally powered units have the correct power cubes (12V for Volamp).**
- 2. Remove fibre and view transmit port from about 2 feet, (do not do this if there is a laser warning on the equipment). you should see dull red light at the bottom of receptacle. If not unit is almost certainly faulty. Check fibre used, protruding fibres can cause this problem.**
- 3. Are both ends LINK indicators off. If yes try reversing one ends Tx to Rx. If fault still persists its either cable or both (unlikely) drive / receive units.**
- 4. To check a unit. Do a rough check on a simplex patch cable by holding one end to a light and view other end. Remove unit from system or following procedures will cause collisions. Connect Tx to Rx with the patch cable. Ensure unit is powered. If the light does not indicate a good link unit will be faulty.**
- 5. To check cabling in system. After units have been checked as above then it is possible to identify the cable fault. Patch cables may be checked as in 4. To get a rough idea of the quality of a cable withdraw the Tx end. You should be able to withdraw to around the end of the barrel. If you reverse the patch cable and repeat then the end which can be withdrawn the furthest is the better end and preferably should go to the output. The patch cable will normally be a duplex type which after checking in simplex mode may be checked in duplex mode by connecting ends with a bulkhead barrel, (use the patch tray bulkhead if you don't have one available).**
- 6. Test main fibre cable by connecting far end Tx to Rx with a tested simplex patch lead. Near end LINK indicator should still be on.**
- 7. Finally check total system by connecting together via a barrel the patch leads which go into the far unit. The tolerance (flux budget) is such that LINK indication is given in all, but the most extreme situations i.e., long cables, core mismatch or multiple patches.**