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A low cost redundant store and forward DAQ system for KM3NeT, using copper in the Vertical String

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The described system transports data from the Optical Modules to the on-shore data acquisition system using copper twisted pairs for the short runs and fiber optics for long distance to the Shore Station. VDSL2, developed for 'video to the home', provides > 100 Mbit/s bandwidth over a single twisted copper pair in the vertical string to transport all the data from an Optical Module to the Master Module. The same twisted pair is also used to transport power and timing to the Optical Module. All data communication, timing and timing calibration between the Shore Station and the Optical Modules as well as the distribution of power in the vertical string, is done via a single Master Module in the vertical string. A single channel of the long distance fiber optical DWDM system provides the data communication of a Master Module to the Shore Station. Reliability is a design issue of common infrastructure. A large part of the DWDM and the power system uses a common infrastructure. Each vertical line has two separate paths to the Shore Station via separate Junction Boxes. Destructive single point failures in the common infrastructure divide the system in two parts, but each part is independent fully functional.

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