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NANET3: THE ON-SHORE READOUT AND SLOW-CONTROL BOARD FOR THE KM3NET-IT UNDERWATER NEUTRINO TELESCOPE

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The KM3Net-Italia underwater neutrino detection unit, the tower, consists of 14 floors.
Each floor supports 6 Optical Modules containing front-end electronics needed to digitize the PMT signal, format and transmit the data and 2 hydrophones used to reconstruct in real-time the position of Optical Modules, for a maximum tower throughput of more than 600 MB/s. All floor data are collected by the Floor Control Module (FCM) board and transmitted by optical
bidirectional virtual point-to-point connection to the on-shore laboratory. Each FCM needs an on-shore communication endpoint counterpart. In this contribution we present NaNet3, an on-shore readout board based on Altera Stratix V GX FPGA able to manage multiple FCM data channels with a capability of 800 Mbps each. The design represents a NaNet customization for the KM3NeT-Italia experiment, adding support in its I/O interface for a synchronous link protocol with deterministic latency at physical level and for a Time Division Multiplexing protocol at data level.

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