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KM3NeT Neutrino Telescope 1-ns resolution Time To Digital Converters

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The KM3NeT collaboration aims the construction of a multi-km³ high-energy neutrino telescope in the Mediterranean sea consisting of thousands of glass spheres, each of them containing 31 photomultiplier of small photocathode area. The main digitization system is composed by 31 Time to Digital Converter channels with 1-ns resolution embedded in a Field Programmable Gate Array. An architecture with low resources occupancy has been chosen allowing the implementation of other instrumentation, communication and synchronization systems on the same device. The 4-Oversampling technique with two high frequency clocks working in opposed phases has been used together with an asymmetric FIFO memory. In the present article the architecture and the first results obtained with the Time to Digital Converters are presented.

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