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KM3NeT developments at IFIC: Acquisition electronics and time calibration instrumentation

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The KM3NeT Collaboration is incrementally building and operating two deep sea neutrino telescopes at the bottom of the Mediterranean Sea. The telescopes consist of matrices of photomultipliers housed in pressure-resistant glass spheres, the so-called Digital Optical Modules which houses 31 small photocatode photomultipliers. The IFIC group in KM3NeT has led the development of the acquisition electronics as well as the design of the time calibration device housed in the Digital Optical Module, the Nanobeacon. For the first phase of the construction of the telescopes, there have been produced several tens of Detection Units, of which 36 have already been deployed with more than 20000 photomultipliers installed. Once finished, the two telescopes will have installed more than ten thousand acquisition nodes, completing one of the more complex networks in the world in terms of operation and synchronisation. This work presents the developments carried out at IFIC for the development of the KM3NeT acquisition electronics and the time calibration instrumentation.

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