

# White Rabbit FMC mezzanine as an interface for the new 10G WR-NIC to remote WR DAQ nodes

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The White Rabbit protocol (WR), developed at CERN for the distribution of sub-nanosecond timing to thousands of nodes distributed over large geographic areas, is becoming increasingly reliable and used in many contexts, especially in the modern landscape of multi-messenger astronomy experiments in progress such as KM3NeT, CTAO and of course ET.

Currently, the White Rabbit switch is basically the only equipment designed with wide usability by the user community in mind. At the present time, WR implements connectivity with 1 Gb/s Ethernet, both point-to-point 1GB and through WR-switches. WR-switch represents only the timing distribution layer, while the compatible consumer products for data acquisition are mostly proprietary development for specific applications. Fortunately, the WR community is already conceiving new developments toward a full 10 GB/s infrastructure where a new PCIe NIC board is foreseen to connect PCs to the WR network.

INFN-Bologna and INFN-Perugia are designing a set of low-cost electronic boards that allow a versatile management and readout of the most common sensors or actuators using White Rabbit technology for the time-synchronization. We propose a lightweight dedicated mezzanine board, named Air-Plane, to equip the upcoming new NIC board in order to interface between legacy WR-node as well as with non-WR remote cards. Such a modular and highly scalable design will ease the implementation of data acquisition systems in testing situations, e.g. ET mirror suspensions developments.

In this contribution we present the Air-Plane conceptual design and its potential use. A realization plan exists as a task of the M2TECH project, whose proposal has been recently submitted to the HORIZON-INFRA-2024-TECH-01-01 call and it will be presented in this contribution as well.

**Primary authors:** BAWAJ, Mateusz (INFN Perugia); TRAVAGLINI, Riccardo (INFN - Sezione di Bologna); Dr CHIARUSI, Tommaso (INFN - Sezione di Bologna)

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