

RTM Backplane Extension for the MTCA.4 Standard

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The idea of the RTM Backplane was originally created to simplify cable management of an MTCA.4 based LLRF control system for the European XFEL project. The first RTM backplane (called an RF Backplane) was designed to distribute about dozen of precise RF and clock signals to uRTM cards. It was quickly found out, that this backplane offers very powerful extension possibilities for the MTCA.4 standard and can be used also more widely than for the RF applications only. Additionally it found significant interest in the MTCA.4 community. This contribution describes the joint effort put in working out the entire RTM Backplane extension: starting from the design of high-performance backplane PCB able to distribute tens of clock and RF signals (DC to 6 GHz) together with low noise power supply and data transmission, going through mechanical integration with crates and development of management and rear power supply solutions that do not violate the MTCA.4 standard, ending on description of a huge effort of the PICMG hardware team that further developed and put the RTM Backplane concept into the formal frames of PICMG document. Additionally, the most important features of the RTM Backplane extension will be described together with the effort of creating the final, PICMG standard compatible RF Backplane version for the E-XFEL project.

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