

RF Backplane for MTCA.4 Based Control System

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Modern accelerator control systems take advantages of the MTCA.4 platform to implement parallel processing of tens of RF signals within one crate. The analog front-end electronics require distribution of many high-frequency signals (like phase reference and Local Oscillator (LO)) to all cards located in the crate. This can be realized by coaxial cables but it reduces system reliability, maintainability and performance. To reduce limitations of RF cabling network an unique RF Backplane (uRFB) for RTM cards was developed. This backplane is used for distribution of high-performance LO, RF and low-jitter clock signals together with low-noise analog power supply to analog RTM cards in the system. The concept allows also for using of up to four extended-RTMs (eRTMs) and up to two rear power modules in the area behind the front power modules, usually not used by the MTCA.4 standard. The rear system hardware platform management was developed as an extension of existing management system. The presented RF backplane concept is a powerful extension of the MTCA.4 capabilities and it does not collide with standard solutions.

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