

## MTCA.4 Usage in the Femtosecond-synchronization System at European XFEL

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The optical synchronization system at the European XFEL serves as femtosecond-stable reference throughout the 3.5 km long facility. Its signal is essential for the pump-probe experiments, first by enabling the LLRF system to stabilize the electron bunch arrival time and thereby the FEL X-ray pulse timing, and second by synchronizing the experimental laser to fs precision. Most of the electronic hardware is realized in various MTCA.4 AMC-, RTM-, and FMC-Modules, most of them specially designed for this application. Several digital control feedback loops are implemented on FPGAs for the laser synchronization, the fiber link stabilization, and the 32 different end-stations. This talk will give a short introduction on the system and explain the involved hardware and software components.

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