

Sub-Nanosecond Machine Timing and Frequency Distribution Via Serial Data Links

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FERMI@ELETTRA is a 4th generation light source under construction at Sincrotrone Trieste. It will be operated as a seeded FEL driven by a warm S-band Linac which places very stringent specifications on control of the amplitude and phase of the RF stations. The local clock generation and distribution system at each station will not be based on the phase reference distribution but rather on a separate frequency reference distribution which has significantly less stringent phase stability requirements. This frequency reference will be embedded in the serial data link to each station and has the further advantage of being able to broadcast synchronous machine timing and clocking signals with sub-nanosecond temporal accuracy. This paper describes the design of new RF controls, and specifically the architecture used to distribute the frequency reference along with the precision machine timing and clocking signals.

Primary author: ROHLEV, Tony (Sincrotrone Trieste)

Co-authors: Mr BORGA, Andrea (Sincrotrone Trieste); Mr SERRANO, Javier (CERN); Mr STETTLER, Matt (CERN); Mr CATTIN, Matthieu (CERN)

Presenter: ROHLEV, Tony (Sincrotrone Trieste)

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