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Experiences with picosecond level timing in large systems

The MEG II experiment searches for rare muon decays at PSI, Switzerland. One of the challenges of this experiment is to measure timing of calorimeter and timing counters with a precision down to a few picoseconds. This is accomplished by using the DRS4 Switched Capacitor Array and a high precision timing system using a custom crate standard synchronizing more than 30 crates with over 9000 channels.

We will report the dos and don'ts in designing and running such a large system over several years. This includes clock generation and fan-out, jitter cleaning, noise effects and global time calibrations. The gained experience will be presented in a way that it will be well applicable to other experiments seeking for the ultimate timing.

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