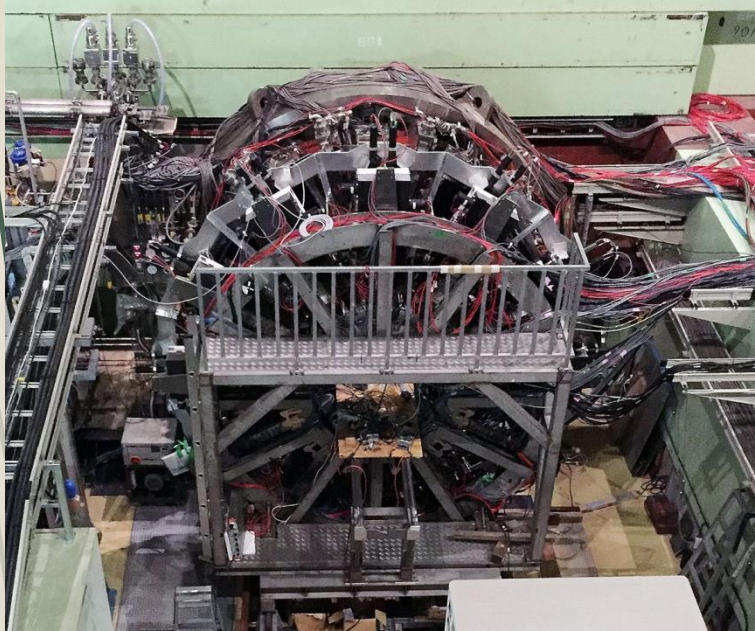


Data Acquisition System for J-PARC E36 Experiment

Y. Igarashi, H. Lu, and R. Tanuma



- J-PARC E36 experiment is a test of LFU using

$$R_K = \Gamma(K^+ \rightarrow e^+\nu) / \Gamma(K^+ \rightarrow \mu^+\nu) .$$

- The aim of the measurement :

$$\Delta R_K / R_K \sim 0.0025$$

- The experiment was performed at J-PARC Hadron Hall.
- The experiment completed data taking in December 2015.

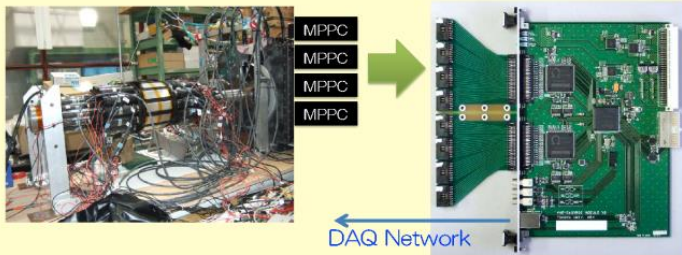
We developed a DAQ system for the experiment.

System integration

for multi-generational readout devices

Special readout device

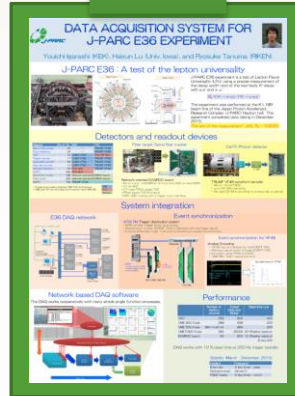
Fiber target/Spiral fiber tracker



Network oriented EASIROC board

- 64-ch input : 2 EASIROC (A front-end ASIC to read SiPM)
- 10-bit ADC
- 0.7-nsec FPGA based TDC
- FPGA based TCP/IP engine
- KEK-VME module with a trigger/busy interface

Poster



We had to use traditional devices and modern devices.

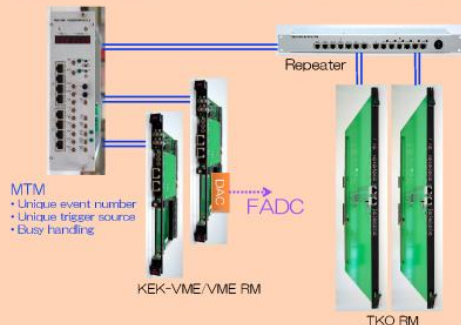
How did we integrate the historical readout devices and the modern readout devices?

Event synchronization

Event synchronization

MTM/RM Trigger distribution system

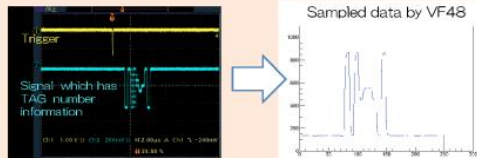
- MTM handles Trigger/Busy hand-shake.
- Global event number (EVENT TAG) is delivered with the trigger signal.
- It works effectively under multi event buffered sub-systems environment.



Event synchronization for VF48

Analog Encoding

- VF48 has no interface for the EVENT TAG
- Making a signal which includes EVENT TAG information using FPGA and DAC
- VME-RM + DAC mezzanine card



Integration by the common network

The DAQ works cooperatively with many simple single function processes.

