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First phase of control system for compact Muon Linac at J-PARC

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A muon linear accelerator (Muon Linac) for the muon g-2/EDM experiment is currently under construction at Japan Proton Accelerator Research Complex (J-PARC). The objective of this project is to accelerate thermal muons (25 meV at 300 K) to 212 MeV, marking the world's first implementation of muon acceleration.
Development of the control system for the Muon Linac began in 2024, with the implementation of the Ultra-Slow Muon (USM) section – the initial acceleration stage up to 5.6 keV – nearly completed in April 2025.
The system adopts the standard EPICS framework and features a compact architecture consisting of (a) a QNAP NAS for disk storage and LDAP-based user authentication, (b) two operator terminals, and (c) two commercial micro servers serving as the EPICS IOC and the archiver server, respectively.
Core functionalities of the control system are scheduled for verification during May and June, followed by beam commissioning of the USM section in December 2025.
This paper reports on the status of the control system development for the USM section, as part of the first phase of the Muon Linac project. Toward the full commissioning of the entire Muon Linac in 2028, the prospects for extending the present control system to the main Linac components are discussed.

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Footnotes

Author: YANG, Min (High Energy Accelerator Research Organization)

Co-authors: Dr KAMIKUBOTA, Norihiko (High Energy Accelerator Research Organization); YAMADA, Shuei (High Energy Accelerator Research Organization); Dr KIMURA, Masato (High Energy Accelerator Research Organization); OTANI, Masashi (High Energy Accelerator Research Organization)

Presenter: YAMADA, Shuei (High Energy Accelerator Research Organization)

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