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Design and Development of Control system for the RAON μ SR facility in Korea using EPICS

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A control system using EPICS was designed and developed to control and monitor components of the μ SR facility at the Rare Isotope Science Project in Korea. In order to ensure that the components work normally during the facility operation, the status of components has to be checked continuously, moreover, the components have to be able to be controlled remotely. Experimental Physics and Industrial Control System (EPICS) is a real-time control system for scientific instruments such as particle accelerators, telescopes, and other large scientific experiments. All information in the facility is controlled by EPICS. Most commercial vacuum pumps have each communication protocol for serial communication. Other components, such as flow meters and thermocouples, send the desired value in forms of the current. An Arduino Uno module was added to transmit the current as a digital signal. The signals are sent to EPICS installed in Raspberry Pi 4 by serial communication. Components that are difficult to communicate with EPICS through serial communication are connected to EPICS via programmable logic controllers (PLC). Internal relay systems of PLCs are coded to control and monitor each component through the remote connector. Process variables in EPICS are controlled from a graphical user interface designed by Control System Studio and recorded in the Archiver appliance installed on the workstation.

Primary author: Mr JEONG, Jae Young (Hanyang Univ. South Korea.)

Co-authors: Mr KIM, Jae Chang (Department of Nuclear Engineering, Hanyang University); Mr JANG, Taek Jin (Department of Physics, Chungang University); Dr JU HAHN, Lee (Institute for Basic Science); Dr LEE, Wonjun (Institute for Basic Science); Prof. KIM, Yong Kyun (Department of Nuclear Engineering, Hanyang University)

Presenters: Mr JEONG, Jae Young (Hanyang Univ. South Korea.); Mr KIM, Jae Chang (Department of Nuclear Engineering, Hanyang University)

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