DNP CEU Abstract

Rebecca Powers

Creighton University, for STAR Collaboration

SLOW CONTROLS SOFTWARE DESIGN FOR BEACON 410A GAS MONITORS FOR THE STAR sTGC

The Solenoidal Tracker at RHIC (STAR) is a large detector system used to analyze heavy ion and polarized proton-proton collisions at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory. During RHIC’s annual runs, radiation levels are too high during beam operation for in-person monitoring of equipment. For safety, efficiency, and convenience, the subsystems are remotely controlled and monitored using EPICS (Experimental Physics and Industrial Control System). An upgrade to STAR, to be installed for data-taking in 2022, is the sTGC (small-strip thin gap chamber), a detector used specifically to detect particles in the forward rapidity region. The sTGC includes a gas system with RKI Instruments Beacon 410A Gas Monitors for monitoring the pentane concentration to avoid excess levels of pentane, which would constitute a flammable hazard. This project used SoftIOC, a Python module that allows the creation of EPICS process variables (PVs) for the new Beacon gas monitors. The code defines the various MODBUS\_RTU registers for each Beacon device, a variable associated with the device status, and four channels to monitor the gas system. Defined within each channel are the gas status, the measured value, and its units. The code, along with the Beacon gas monitors, will be installed and tested before the beginning of the 2022 run. This poster will outline the methodology and design behind the Beacon gas monitors’ process variables and provide insight into the Python code to be implemented.