SUPERVISOR WATCHDOG CIRCUIT FOR MONITORING ACCELERATOR BEAM PROPERTIES AND CONTROLLING THE SAFETY INTERLOCK SYSTEM

Iveta STEBLEVSKA, Mark R. DAYMOND
Queen's University, Kingston, Canada

A supervisor watchdog circuit was developed to monitor the dose and temperature in an accelerator beamline and control the safety interlock system of the accelerator. The implementation involved a D-type flip flop and subsequent logic gates to monitor the input and output signal states and used a series of LEDs to inform the user about the state of the system and to enable identification of issues causing the beamline to shut down. The design allowed for a manual circuit restart to be performed to continue signal monitoring and accelerator operation. The minimization of power consumption by the system was considered. The supervisor watchdog circuit will be installed into the tandem accelerator in the Reactor Materials Testing Laboratory at Queen's University to monitor the beam properties during nuclear material irradiation experiments. The scope for future improvements of the circuit such as automatic circuit restart and addition of new signals is discussed.

Keywords: watchdog; accelerator control; control system; accelerator electronics