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Design and Implementation of LabVIEW Based Relay Autotuning Controller for Level Setup

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Abstract : Even though the PID controller is widely used in industrial process, tuning of PID parameters are not easy. It is a time consuming and requires expert people. Another drawback of PID controller is that process dynamics might change over time. This can happen due to variation of the process load, normal wear and tear etc. To compensate for process behavior change over time, expert users are required to recalibrate the PID gains. Implementation of model based controllers usually needs a process model. Identification of process model is time consuming job and no guaranty of model accuracy. If the identified model is not accurate, performance of the controller may degrade. Model based controllers are quite expensive and the whole procedure for the implementation is sometimes tedious. To eliminate such issues Autotuning PID controller becomes vital element. Software based Relay Feedback Autotuning Controller proves to be efficient, upgradable and maintenance free controller. In Relay Feedback Autotune controller PID parameters can be achieved with a very short span of time. This paper presents the real time implementation of LabVIEW based Relay Feedback Autotuning PID controller. It is successfully developed and implemented to control level of a laboratory setup. Its performance is analyzed for different setpoints and found satisfactorily.

Keywords : autotuning, PID, liquid level control, recalibrate, labview, controller
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