Title:
Real Time Design and Implementation of Industrial Generalized Predictive Control on Two Semi-Industrial Processes

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Abstract:
In this paper a PLC-based industrial Generalized Predictive Control is presented for two semi-industrial processes with different behavior available in Shiraz University laboratory. The first process is a thermal plant with slow dynamic and the other is a fast tank level system with integral effect. Nowadays programmable logic controllers have found wide acceptance in industries due to their remarkable benefits. On the other hand, advanced control theories, which need powerful processors, are growing rapidly in academia. These techniques are not implementable in the existed PLCs in industries and this can result in a gap between industries and academia. Therefore searching new ways for implementing these advanced control methods and upgrading existed PLCs without spending much money is an important issue. In this paper an Industrial Generalized Predictive Control based on PLC-5V30 have been implemented for two processes, using fast programming techniques. A comparison between the this control technique and traditional PID controllers for the same PLC is also presented. Also, the results show the applicability of the mentioned method for the systems with both slow and fast dynamics.

Key words:
Programmable Logic Controller (PLC), Generalized Predictive Controller (GPC), Industrial GPC (IGPC), Step 7, PID controller

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