

1. Record Nr.	UNINA9910299838403321
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Titolo	PID Controller Tuning Using the Magnitude Optimum Criterion / / by Konstantinos G. Papadopoulos
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-07263-3
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (303 p.)
Disciplina	620 621.317 629.8 660
Soggetti	Automatic control Chemical engineering Power electronics Control and Systems Theory Industrial Chemistry/Chemical Engineering Power Electronics, Electrical Machines and Networks
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Part I Introduction and Preliminaries -- Overview -- Background and Preliminaries -- Part II Explicit Tuning of the PID Controller -- Type I Control Loops -- Type II Control Loops -- Type III Control Loops -- Sampled-Data Systems -- Part III Automatic Tuning of the PID Controller -- Automatic Tuning of PID Regulators for Type I Control Loops -- Changes on the Current State of the Art.
Sommario/riassunto	An instructive reference that will help control researchers and engineers, interested in a variety of industrial processes, to take advantage of a powerful tuning method for the ever-popular PID control paradigm. This monograph presents explicit PID tuning rules for linear control loops regardless of process complexity. It shows the reader how such loops achieve zero steady-position, velocity, and acceleration errors and are thus able to track fast reference signals. The

theoretical development takes place in the frequency domain by introducing a general-transfer-function-known process model and by exploiting the principle of the magnitude optimum criterion. It is paralleled by the presentation of real industrial control loops used in electric motor drives. The application of the proposed tuning rules to a large class of processes shows that irrespective of the complexity of the controlled process the shape of the step and frequency response of the control loop exhibits a specific performance. This specific performance, along with the PID explicit solution, formulates the basis for developing an automatic tuning method for the PID controller parameters which is a problem often met in many industry applications—temperature, pH, and humidity control, ratio control in product blending, and boiler-drum level control, for example. The process of the model is considered unknown and controller parameters are tuned automatically such that the aforementioned performance is achieved. The potential both for the explicit tuning rules and the automatic tuning method is demonstrated using several examples for benchmark process models recurring frequently in many industry applications. Advances in Industrial Control aims to report and encourage the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control. aims to report and encourage the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.
