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Titolo	Model-Driven Design Using IEC 61499 : A Synchronous Approach for Embedded and Automation Systems // by Li Hsien Yoong, Partha S. Roop, Zeeshan E. Bhatti, Matthew M. Y. Kuo
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ISBN	3-319-10521-3
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Descrizione fisica	1 online resource (209 p.)
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Soggetti	Electronic circuits Microprocessors Circuits and Systems Processor Architectures
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 and index.
Nota di contenuto	Introduction -- IEC 61499 in a Nutshell -- Introduction to Synchronous Programming Using Esterel -- Formal Model for IEC 61499 Function Blocks -- Efficient Code Synthesis from Function Blocks -- Verification of Function Blocks -- Timing Analysis -- Case Studies.
Sommario/riassunto	This book describes a novel approach for the design of embedded systems and industrial automation systems, using a unified model-driven approach that is applicable in both domains. The authors illustrate their methodology, using the IEC 61499 standard as the main vehicle for specification, verification, static timing analysis and automated code synthesis. The well-known synchronous approach is used as the main vehicle for defining an unambiguous semantics that ensures determinism and deadlock freedom. The proposed approach also ensures very efficient implementations either on small-scale embedded devices or on industry-scale programmable automation controllers (PACs). It can be used for both centralized and distributed implementations. Significantly, the proposed approach can be used

without the need for any run-time support. This approach, for the first time, blurs the gap between embedded systems and automation systems and can be applied in wide-ranging applications in automotive, robotics, and industrial control systems. Several realistic examples are used to demonstrate for readers how the methodology can enable them to reduce the time-to-market, while improving the design quality and productivity.

- Describes a mathematically rigorous, model-driven approach for designing embedded / automation systems using IEC 61499.
- Demonstrates how correct-by-construction code can be automatically derived from IEC 61499 models.
- Provides a methodology for static timing analysis and model checking of IEC61499 specifications.
- Provides a pedagogical introduction to formal methods in embedded systems for non-experts and industrial practitioners.
