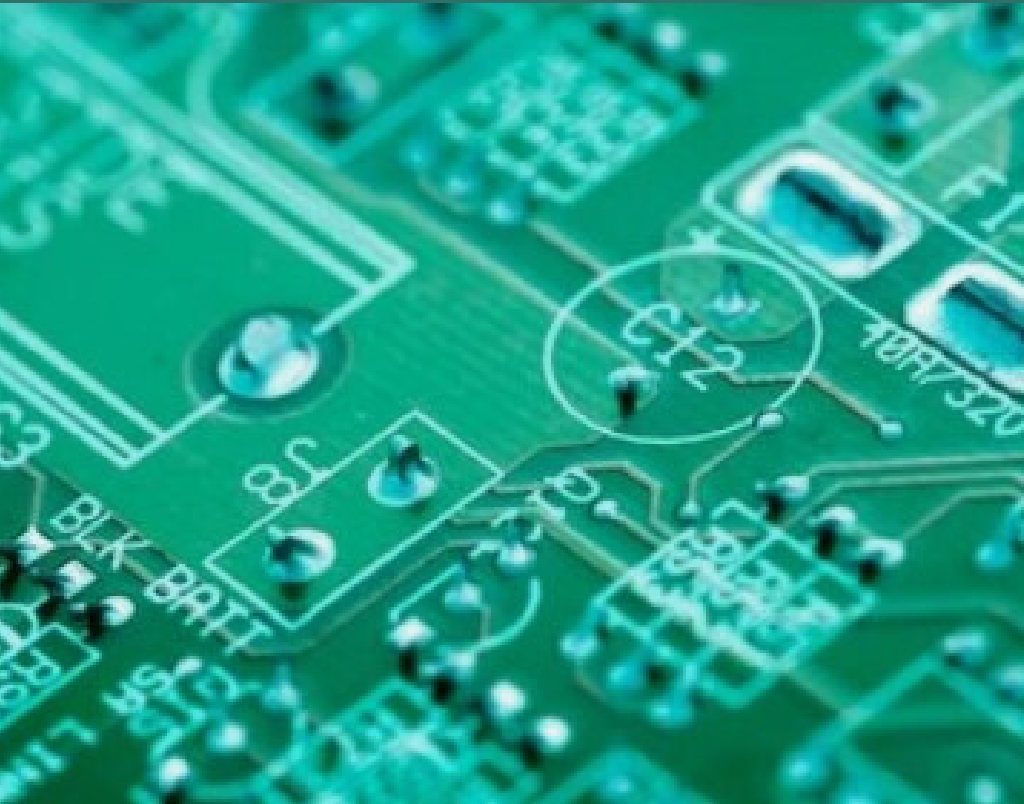


Digital Electronics

|| DECODING THE LANGUAGE OF ELECTRONICS ||



Dr. R. JEYABHARATH
Dr. P. VEENA
Dr. C. SANTHAKUMAR
Dr. A. MURUGESAN


RAMTECH[™]
PUBLICATIONS
EMPOWERING AUTHORS

ISBN: 978-81-965342-0-2

DoI: <https://doi.org/10.5281/zenodo.8262566>

Digital Electronics

|| Decoding the Language of Electronics ||

Authored by

Dr. R. JEYABHARATH

Dr. P. VEENA

Dr. C. SANTHAKUMAR

Dr. A. MURUGESAN



Digital Electronics || Decoding the Language of Electronics ||

Dr. R. JEYABHARATH, Dr. P. VEENA, Dr. C. SANTHAKUMAR, Dr. A. MURUGESAN

First Edition: 2023

ISBN: 978-81-965342-0-2



DOI: <https://doi.org/10.5281/zenodo.8262566>

Price: Rs.720/-

Copy right

All rights reserved. No part of this book may be reproduced, stored in retrieval systems or transmitted, in any form or by any means, mechanical, photocopying, recording or otherwise, without prior written permission of the author.

Imprint

Any brand names and product names mentioned in this book are subject to trademark, brand or patent protection and are trademarks or registered trademarks of their respective holders. The use of brand names, product names, common names, trade names, product descriptions etc. even without a particular marking in this work is in no way to be construed to mean that such names may be regarded as unrestricted in respect of trademark and brand protection legislation and could thus be used by anyone.

Publisher

RAALTECH PUBLICATIONS

(An ISO 9001:2015 Publishing Company)

Bangalore || Chennai || Coimbatore

Mobile: +91 70940 77040

E-mail: info@raaltechpublications.com

Web: www.raaltechpublications.com

Overseas Services at Germany || Sweden

With deep gratitude, this book is dedicated to the Almighty God, whose divine guidance, along with the unwavering support of my family and friends, has brought this creation to life.

Acknowledgments

We would like to express our deepest gratitude to all the individuals and organizations that have contributed to the creation of this textbook.

I wish to express my deep sense of gratitude and thanks to **Mr.R.Srinivasan, Chairman, KSR Educational Institutions and Dr.M.Venkatesan, Principal, K S R Institute for Engineering and Technology - Tiruchengode, Namakkal** for motivating us to undertake this book.

We are also grateful to our colleagues who have provided feedback on early drafts of this book, and whose constructive criticism and encouragement have helped to shape the final product.

We also want to extend our thanks to the publishers, **RAALTECH Publications**, for their assistance and support throughout the publication process. Their dedication to producing high-quality educational materials has been evident at every stage, and we are honoured to have worked with such a professional team.

Finally, we would like to thank our families and loved ones for their unwavering support and encouragement. Their patience and understanding during the long hours spent writing this book has been truly appreciated.

Dr. R. JEYABHARATH

Dr. P. VEENA

Dr. C. SANTHAKUMAR

Dr. A. MURUGESAN

Preface

Our primary objective is to provide readers with an all-encompassing grasp of the intricate world of "Digital Electronics." The aim is to facilitate a profound understanding of Boolean algebra, combinational circuits, synchronous and asynchronous sequential circuits, programmable logic devices, memory systems, logic families, and digital integrated circuits, along with practical insights into their applications.

We have structured this book to be accessible to a wide range of readers, from students and educators to practitioners and researchers. The book is organized into 8 chapters, each of which covers a specific aspect of Digital Electronics. We have also included many examples and case studies throughout the book to illustrate key concepts and applications.

We believe that this book offers a unique perspective on Digital Electronics that is grounded in both theory and practice. Our hope is that readers will find the content engaging and informative, and that it will inspire them to further explore the field and apply the concepts and techniques presented in the book.

We hope that this book will prove to be a valuable resource for anyone interested in Digital Electronics, and that it will contribute to the on-going development and advancement of the field.

Dr. R. JEYABHARATH

Dr. P. VEENA

Dr. C. SANTHAKUMAR

Dr. A. MURUGESAN

The book "**Digital Electronics- Decoding the Language of Electronics**" is a captivating field that underpins modern technology. Central to it is Boolean Algebra, which drives complex circuit design using logic gates, truth tables, and expressions. Combinational circuits process inputs directly, while synchronous sequential circuits add time-based behavior through flip-flops, enabling memory and state control. Asynchronous circuits operate without a global clock, accommodating unpredictable delays. Programmable Logic Devices (PLDs), like FPGAs and CPLDs, offer reconfigurable circuits without custom fabrication. Memory, with RAM and ROM, stores data, and logic families like TTL, CMOS, and ECL provide hardware options. This book supports innovations across microprocessors, electronics, and automation, with a grasp of these concepts empowering engineers for the digital future.



Dr. R. JEYABHARATH received B.E in EEE from Thaigarajar College of Engineering, M.E in PED from PSG College of Technology, Coimbatore. He received Ph.D. from the Anna university, Chennai. He has over 20 years of experience. He supervised 10 Ph.D Scholars and 3 are pursuing. He has authored more than 38 papers in international journals and IEEE conferences. His research interest includes multilevel inverters, control of power converters, VFDs and EVs. He is currently working as a **Professor at the Department of Electrical and Electronics Engineering, K S R Institute for Engineering and Technology, Tiruchengode.**



Dr. P. VEENA received B.E. in EEE from Government College of Engineering, Salem, M.E in PED and secured Gold Medal from Anna University, Chennai. She completed her Doctorate at Anna University, Chennai. She has supervised 2 Ph.D Scholars and 3 are pursuing. She has published 43 papers in International Journals & conferences related to her research work. She is a life member of the Institution of Engineers & ISTE. Her technical interests include embedded system, Special Electrical Machines, Intelligent Control and Direct Torque Control for AC drives. Currently, she is working as **Professor in Department of EEE at KSR Institute for Engineering and Technology, Tiruchengode.**



Dr. C. SANTHAKUMAR received B.E. in EEE from Anna University and received M.E. in VLSI DESIGN from Anna University. He received Ph.D. in Information and Communication Engineering from Anna University, Chennai. He is currently working as a **Head of the Department / Associate Professor in the Department of EEE, K S R Institute for Engineering and Technology, Tiruchengode, Tamilnadu.** He has 25 years of teaching Experience. He has published 20 international journals and attended more than 50 conference and FDPs, workshop & seminar.



Dr. A. MURUGESAN received B.E. in ICE From Arulmigu Kalasalingam College of Engineering, M.E. in C & I From Arulmigu Kalasalingam College of Engineering and Doctorate in Electrical Engineering from Anna University, Chennai. He has 18 years of teaching and research experience. His research area includes measurements and instrumentation, embedded systems. He has published 12 papers in International Journals. Chaired more than 15 conferences, presented lectures in various Institutions. Presently He is working as an **Associate Professor in K S R Institute for Engineering and Technology, Tiruchengode, Tamil Nadu.**



DOI: <https://doi.org/10.5281/zenodo.8262566>

