

Acces PDF  
Embedded  
Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2  
Embedded  
Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2  
Interfacing  
To The  
Msp432 Micr  
ocontroller  
Volume 2

*The Rabbit 3000 is a*

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

*popular high-performance microprocessor specifically designed for embedded control, communications, and Ethernet connectivity. This new technical reference book will help designers get the most out of the Rabbit's powerful feature set. The first book on the*

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2: Rabbit

*architecture and*

*development*

*environment,*

*interfacing to the*

*external world,*

*networking, Rabbit*

*assembly language,*

*multitasking,*

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

*debugging, Dynamic C  
and much more!*

*Authors Kamal Hyder*

*and Bob Perrin are*

*embedded engineers*

*with years of*

*experience and they*

*offer a wealth of*

*design details and*

*"insider" tips and*

*techniques. Extensive*

*embedded design*

*examples are supported*

# Acces PDF Embedded

*Systems Real Time Interfacing To The Msp432 Microcontroller Volume 2*  
*by fully tested source code. Whether you're already working with the Rabbit or considering it for a future design, this is one reference you can't be without! Let the experts teach you how to design embedded systems that efficiently hook up to the Internet using networked core*

# Acces PDF Embedded

*Systems Real Time Interfacing To The Msp432 Microcontroller Volume 2*  
*modules Provides a number of projects and source code using RabbitCore, which will make it easy for the system designer and programmer to get hands-on experience developing networked devices*

*This tutorial reference takes the reader from use cases to complete*

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Embedded

Systems Real

*architectures for real-time embedded systems*

*using SysML, UML,*

*and MARTE and*

*shows how to apply the*

*COMET/RTE design*

*method to real-world*

*problems. The author*

*covers key topics such*

*as architectural*

*patterns for distributed*

*and hierarchical real-*

*time control and other*

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 3

*real-time software architectures, performance analysis of real-time designs using real-time scheduling, and timing analysis on single and multiple processor systems. Complete case studies illustrating design issues include a light rail control system, a microwave*



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Systems Real

Time Interfacing

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Microcontroller

Volume 2

*oven control system,  
and an automated  
highway toll system.  
Organized as an  
introduction followed  
by several self-  
contained chapters, the  
book is perfect for  
experienced software  
engineers wanting a  
quick reference at each  
stage of the analysis,  
design, and*

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Systems Real

Time Interfacing

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Microcontroller

Volume 2

*development of large-scale real-time*

*embedded systems, as*

*well as for advanced*

*undergraduate or*

*graduate courses in*

*software engineering,*

*computer engineering,*

*and software design.*

*Real-time and*

*embedded systems are*

*essential to our lives,*

*from controlling car*

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Systems Real

*engines and regulating*

*traffic lights to*

*monitoring plane*

*takeoffs and landings*

*to providing up-to-the-*

*minute stock quotes.*

*Bringing together*

*researchers from both*

*academia and industry,*

*the Handbook of Real-*

*Time and Embedded*

*Systems provides*

*comprehensive covera*

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Systems Real

Time Interfacing

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Microcontroller

Volume 2

*Learn to design and develop safe and reliable embedded systems Key Features*

*Identify and overcome challenges in embedded environments*

*Understand the steps required to increase the security of IoT solutions*

*Build safety-critical and memory-safe parallel and*

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

*distributed embedded  
systems Book*

*Description Embedded  
systems are self-*

*contained devices with  
a dedicated purpose.*

*We come across a  
variety of fields of  
applications for  
embedded systems in  
industries such as  
automotive,*

*telecommunications,*

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Systems Real

*healthcare and  
consumer electronics,  
just to name a few.*

Time Interfacing  
To The Msp432

Microcontroller

Volume 2  
Architecture begins

*with a bird's eye view  
of embedded*

*development and how*

*it differs from the*

*other systems that you*

*may be familiar with.*

*You will first be guided*

*to set up an optimal*

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

*development environment, then move on to software tools and methodologies to improve the work flow. You will explore the boot-up mechanisms and the memory management strategies typical of a real-time embedded system. Through the analysis*

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Systems Real

*of the programming  
Time Interfacing  
interface of the*

*reference*

*microcontroller, you'll*

*look at the*

*implementation of the*

*features and the device*

*drivers. Next, you'll*

*learn about the*

*techniques used to*

*reduce power*

*consumption. Then you*

*will be introduced to*



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Systems Real

Time Interfacing

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Microcontroller

Volume 2

*the technologies,  
protocols and security  
aspects related to  
integrating the system  
into IoT solutions. By  
the end of the book,  
you will have explored  
various aspects of  
embedded architecture,  
including task  
synchronization in a  
multi-threading  
environment, and the*

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*safety models adopted  
by modern real-time  
operating systems.*

*What you will learn  
Participate in the  
design and definition  
phase of an embedded  
product Get to grips  
with writing code for  
ARM Cortex-M  
microcontrollers Build  
an embedded  
development lab and*

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Systems Real

*optimize the workflow*

Time Interfacing

*Write memory-safe*

To The Msp432

*code Understand the*

Microcontroller

*architecture behind the*

Volume 2

*communication*

*interfaces Understand*

*the design and*

*development patterns*

*for connected and*

*distributed devices in*

*the IoT Master*

*multitask parallel*

*execution patterns and*

# Acces PDF Embedded

*Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2*  
*real-time operating  
systems Who this book  
is for If you're a  
software developer or  
designer wanting to  
learn about embedded  
programming, this is  
the book for you.*

*You'll also find this  
book useful if you're a  
less experienced  
embedded programmer  
willing to expand your*

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Embedded

Systems Real

*knowledge.*

*Real-Time Embedded*

*Systems*

*Embedded Systems*

*Foundations of Cyber-*

*Physical Systems*

*Design Patterns for*

*Great Software*

*Node.js for Embedded*

*Systems*

*Design Principles and*

*Engineering Practices*

*A Cyber-Physical*

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Systems Real

*Systems Approach*

Time Interfacing

To The Msp432

Microcontroller

Volume 3

Test EXecute and

Simulate (TExaS)

which can be used

to develop

hardware/software

embedded systems

on a variety of

Motorola 6800

series computers.

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Systems Real  
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Volume 3

The book focuses in particular on the Motorola 6811 and 6812 and describes both the general processes and specific details involved in microcomputer simulation.

There's something really satisfying about turning theory

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Volume 2

into practice,  
bringing with it a  
great feeling of  
accomplishment.  
Moreover it usually  
deepens and  
solidifies your  
understanding of the  
theoretical aspects  
of the subject, while  
at the same time  
eliminating  
misconceptions and



Systems Real  
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Microcontroller  
Volume 2

misunderstandings.  
So it's not surprising  
that the the  
fundamental  
philosophy of this  
book is that 'theory  
is best understood  
by putting it into  
practice'. Well, that's  
fine as it stands.  
Unfortunately the  
practice may a bit  
more challenging,

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Systems Real  
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Volume 2

especially in the field of real-time operating systems.

First, you need a sensible, practical toolset on which to carry out the work. Second, for many self-learners, cost is an issue; the tools mustn't be expensive. Third, they mustn't be

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difficult to get, use  
and maintain. So  
what we have here  
is our approach to  
providing you with a  
low cost toolset for  
RTOS

experimentation. The  
toolset used for this  
work consists of: A  
graphical tool for  
configuring  
microcontrollers

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Systems Real

(specifically  
Time Interfacing  
STM32F variants) -

STM32CubeMX

Microcontroller

software  
Volume 2  
application. An

Integrated

Development

Environment for the

production of

machine code. A

very low cost single

board computer with

inbuilt programmer

## Access PDF Embedded

Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 8

and debugger. All software, which is free, can be run on Windows, OSX or Linux platforms. The Discovery kit is readily available from many electronic suppliers. The RTOS used for this work is FreeRTOS, which is integrated with the

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Systems Real

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Microcontroller

Volume 2

CubeMX tool. The author: Jim Cooling has had many years experience in the area of real-time embedded systems, including electronic, software and system design, project management, consultancy, education and

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Systems Real  
course  
Time Interfacing  
development. He  
To The Msp432  
has published  
Microcontroller  
extensively on the  
Volume 2  
subject, his books  
covering many  
aspects of  
embedded-systems  
work such as real-  
time interfacing,  
programming,  
software design and  
software

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Microcontroller

Volumes 2

engineering.  
Currently he is a

partner in

Lindentree

Associates (which

he formed in 1998),

providing

consultancy and

training for real-time

embedded

systems. See: [www.lindentreeuk.co.uk](http://www.lindentreeuk.co.uk)

Arduino is an open-



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Microcontroller

Volume 2

source electronics  
platform based on  
easy-to-use

hardware and  
software while

LabVIEW is a  
graphical

programming telling

how to connect

functions and work

with a variety of

datatypes when

constructing

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Systems Real

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Microcontroller

Volume 2

applications. This book will help beginners to get started with Arduino-based embedded systems including essential know-how of the programming and interfacing of the devices. Book includes programming and simulation of

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Volume 2

Arduino-based projects and interfacing with LabVIEW, based on practical case studies. The book comprises of total twenty five chapters with description, working model of LabVIEW and programming with Arduino IDE.

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Microcontroller

Volume 2

This book  
comprehensively  
covers the three  
main areas of the  
subject: concepts,  
design and  
programming.

Information on the  
applications of the  
embedded/real-time  
systems are woven  
into almost every  
aspect discussed

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Time Interfacing

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Microcontroller

Volume 2

which of course is inevitable. Hardware architecture and the various hardware platforms, design & development, operating systems, programming in Linux and RTLinux, navigation systems and protocol converter are discussed

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Microcontroller

Volume 2

extensively. Special emphasis is given to embedded database and Java

applications, and embedded software development.

Introduction to

Embedded

Systems.

Architecture of

Embedded

Systems.

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Microcontroller

Volume 2

Embedded System  
Development.

Hardware Platforms.

Communication

Interfaces. Embedd

ed/Real-Time

Operating System

Concepts. Overview

of Embedded/Real-

Acces PDF

Embedded

Systems Real

Time Operating

Systems· Target

Image Creation·

Representative

Embedded

Systems·

Programming in

Linux· Programming

in RTLinux·

Development of

Navigation System·

Development of

Protocol Converter·



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Microcontroller

Volume 2

Embedded Software

Development on

89C51 Micro-

Controller Platform.

Embedded Software

Development on

AVR Micro-

Controller Platform.

Embedded Systems

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Systems Real

Applications Using

Time Interfacing

To The Msp432

Platform. Future

Trends

Microcontroller

Volume 2

Embedded System

Design

Methods,

Techniques, Tools,

Processes, and

Teamwork

The Foundations

Using

Microcontrollers and

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Embedded

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Microcontroller

Value

the MSP430

Solution Manual for

Embedded Systems

Using STM Cube,

FreeRTOS and the

STM32 Discovery

Board

**Embedded**

**System**

**Interfacing:**

**Design for the**

**Internet-of-**

Acces PDF

Embedded

Systems Real

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Microcontroller

Volume 2

**Things (IoT) and  
Cyber-Physical  
Systems (CPS)  
takes a  
comprehensive  
approach to the  
interface between  
embedded  
systems and  
software. It  
provides the  
principles needed**

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Systems Real

Time Interfacing

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Microcontroller

Volume 2

**to understand  
how digital and  
analog interfaces  
work and how to  
design new  
interfaces for  
specific  
applications. The  
presentation is  
self-contained  
and practical,  
with discussions**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**based on real-world components.**

**Design examples are used**

**throughout the book to illustrate important**

**concepts. This book is a**

**complement to the author's**

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Systems Real

Time Interfacing

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Microcontroller

Volume 2

**Computers as  
Components,  
now in its fourth  
edition, which  
concentrates on  
software running  
on the CPU, while  
Embedded  
System  
Interfacing  
explains the  
hardware**

Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**surrounding the  
CPU. Provides a  
comprehensive  
background in  
embedded  
system  
interfacing  
techniques  
Includes design  
examples to  
illustrate  
important**



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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**concepts and  
serve as the  
basis for new  
designs**

**Discusses well-  
known, widely  
available  
hardware**

**components and  
computer-aided  
design tools**

**This book is one**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**of four books that  
teach the  
fundamentals of  
embedded  
systems as  
applied to the  
Texas  
Instruments  
MSP432  
microcontroller.  
An embedded  
system is a**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**system that performs a specific task and has a computer embedded inside.**

**A system is comprised of components and interfaces connected together for a common**

Acces PDF

Embedded

Systems Real

**purpose. This book teaches the fundamentals of microcontroller interfacing and**

**real-time**

**programming in**

**the context of**

**robotics. There is**

**a chapter on**

**assembly**

**language to**

Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**expose important  
concepts of the  
microcontroller  
architecture.**

**However, most of  
the software  
development  
occurs in C. This  
book can be used  
with Texas  
Instruments  
Robot Systems**

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Systems Real

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Microcontroller

Volume 2

**Learning Kit (TI-RSLK). This book provides an introduction to robots that could be used at the college level with little or no prerequisites. Specific topics include microcontrollers,**

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Volume 2

**fixed-point  
numbers, the  
design of  
software in C,  
elementary data  
structures,  
programming  
input/output  
including  
interrupts, analog  
to digital  
conversion,**

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Microcontroller

Volume 2

**digital to analog  
conversion,  
power, sensor  
interfacing, motor  
interfacing, an  
introduction to  
digital signal  
processing,  
control systems,  
and  
communication  
systems. The**



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Systems Real

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Microcontroller

Volume 2

**book shows how you deploy both Bluetooth Low Energy, and wifi onto the robot, creating an internet of things. This book employs a bottom-up approach to learning. It will**

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Microcontroller

Volume 2

**not include an  
exhaustive  
recapitulation of  
the information in  
data sheets. First,  
it begins with  
basic  
fundamentals,  
which allows the  
reader to solve  
new problems  
with new**

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Systems Real

**technology.**

Time Interfacing

**Second, the book**

To The Msp432

**presents many**

Microcontroller

**detailed design**

Volume 2

**examples. These**

**examples**

**illustrate the**

**process of**

**design. There are**

**multiple**

**structural**

**components that**

**multiple**

**structural**

**components that**

**multiple**

**structural**

**components that**

**multiple**

**structural**

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Volume 2

**assist learning. Checkpoints, with answers in the back, are short easy to answer questions providing immediate feedback while reading. The book includes an index and a**

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Volume 2

**glossary so that  
information can  
be searched. The  
most important  
learning**

**experiences in a  
class like this are  
of course the  
laboratories.**

**Specifically for  
this volume, look  
at the lab**

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Systems Real

assignments for

TI-RSLK

curriculum. There

is a web site

Volume 2

accompanying

this book: [http: //](http://users.ece.utexas.edu/~valvano/arm/robotics.htm)

[users.ece.utexas.](http://users.ece.utexas.edu/~valvano/arm/robotics.htm)

[edu/ valvano/arm/](http://users.ece.utexas.edu/~valvano/arm/robotics.htm)

[robotics.ht](http://users.ece.utexas.edu/~valvano/arm/robotics.htm)

How can we build

bridges from the

digital world of

digital world of

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Microcontroller

Volume 2

**the Internet to the  
analog world that  
surrounds us?**

**By bringing  
accessibility to**

**embedded**

**components**

**such as sensors**

**and**

**microcontrollers,**

**JavaScript and**

**Node.js might**

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Volume 2

**shape the world  
of physical  
computing as  
they did for web  
browsers. This  
practical guide  
shows hardware  
and software  
engineers,  
makers, and web  
developers how  
to talk in**



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Volume 2

**JavaScript with a variety of hardware platforms.**

**Authors Patrick Mulder and Kelsey Breseman also delve into the basics of microcontrollers, single-board computers, and**

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Systems Real

Time Interfacing  
other hardware components. Use

To The Msp432  
JavaScript to

Microcontroller  
program

Volume 2  
microcontrollers

with Arduino and

Espruino

Prototype IoT

devices with the

Tessel 2

development

platform Learn

Acces PDF

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**about electronic  
input and output  
components,  
including  
sensors Connect  
microcontrollers  
to the Internet  
with the Particle  
Photon toolchain  
Run Node.js on  
single-board  
computers such**

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Volume 2

**as Raspberry Pi  
and Intel Edison  
Talk to embedded  
devices with  
Node.js libraries  
such as Johnny-  
Five, and  
remotely control  
the devices with  
Bluetooth Use  
MQTT as a  
message broker**

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Volume 2

**to connect  
devices across  
networks Explore  
ways to use  
robots as**

**building blocks  
for shared  
experiences**

**This book is  
intended to  
provide a senior  
undergraduate or**

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Volume 2

**graduate student  
in electrical  
engineering or  
computer science  
with a balance of  
fundamental  
theory, review of  
industry practice,  
and hands-on  
experience to  
prepare for a  
career in the real-**

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**time embedded  
system  
industries. It is  
also intended to  
provide the  
practicing  
engineer with the  
necessary  
background to  
apply real-time  
theory to the  
design of**

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**embedded  
components and  
systems. Typical  
industries  
include**

**aerospace,**

**medical**

**diagnostic and**

**therapeutic**

**systems, telecom**

**munications,**

**automotive,**



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**robotics,  
industrial  
process control,  
media systems,  
computer  
gaming, and  
electronic  
entertainment, as  
well as  
multimedia  
applications for  
general-purpose**

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**computing. This updated edition adds three new chapters focused on key technology advancements in embedded systems and with wider coverage of real-time architectures.**

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**The overall focus remains the RTOS (Real-Time Operating System), but use of Linux for soft real-time, hybrid FPGA (Field Programmable Gate Array) architectures and advancements in**

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Volume 2

**multi-core  
system-on-chip  
(SoC), as well as  
software  
strategies for  
asymmetric and  
symmetric  
multiprocessing  
(AMP and SMP)  
relevant to real-  
time embedded  
systems, have**

Acces PDF

Embedded

Systems Real

**been added.**

Time Interfacing

**Companion files**

are provided with

numerous project

Microcontroller

**videos,**

Volume 2

**resources,**

**applications, and**

**figures from the**

**book.**

**Instructors'**

**resources are**

**available upon**

**request.**

**Additional**

**resources are**

**available upon**

**request.**

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Systems Real

**adoption.**

**FEATURES: •**

**Provides a**

**comprehensive,**

**up to date, and**

**accessible**

**presentation of**

**embedded**

**systems without**

**sacrificing**

**theoretical**

**foundations •**

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**Features the  
RTOS (Real-Time  
Operating  
System), but use  
of Linux for soft  
real-time, hybrid  
FPGA**

**architectures and  
advancements in  
multi-core  
system-on-chip is  
included •**

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Volume 2

**Discusses an  
overview of  
RTOS  
advancements,  
including AMP  
and SMP  
configurations,  
with a discussion  
of future  
directions for  
RTOS use in  
multi-core**



Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**architectures,**

**such as SoC •**

**Detailed**

**applications**

**coverage**

**including**

**robotics,**

**computer vision,**

**and continuous**

**media • Includes**

**a companion disc**

**(4GB) with**

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Microcontroller

Volume 2

**numerous  
videos,  
resources,  
projects,  
examples, and  
figures from the  
book • Provides  
several  
instructors'  
resources,  
including lecture  
notes, Microsoft**

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Systems Real

**PP slides, etc.**

Time Interfacing

**Embedded Real**

To The Msp432

**Time Systems:Co**

Microcontroller

**ncepts,Design**

Volume 2

**Prog Bb**

**Introduction to**

**the Msp432**

**Microcontroller**

**Embedded**

**Systems Design**

**Exploring**

**Raspberry Pi**

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

**Programming  
Embedded  
Systems  
Real-time  
Operating  
Systems for the  
Arm®  
Cortex(TM)-M3  
Expand  
Raspberry Pi  
capabilities  
with**

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**fundamental  
engineering  
principles  
Exploring  
Raspberry Pi is  
the innovators  
guide to  
bringing  
Raspberry Pi to  
life. This book  
favors  
engineering  
principles over**

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

**a 'recipe'  
approach to  
give you the  
skills you need  
to design and  
build your own  
projects.  
You'll  
understand the  
fundamental  
principles in a  
way that  
transfers to**

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Microcontroller

Volumes

**any type of  
electronics,  
electronic  
modules, or  
external  
peripherals,  
using a  
"learning by  
doing" approach  
that caters to  
both beginners  
and experts.  
The book begins**

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**with basic  
Linux and  
programming  
skills, and  
helps you stock  
your inventory  
with common  
parts and  
supplies. Next,  
you'll learn  
how to make  
parts work  
together to**



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Volume 2

**achieve the goals of your project, no matter what type of components you use. The companion website provides a full repository that structures all of the code and**

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**scripts, along  
with links to  
video tutorials  
and  
supplementary  
content that  
takes you  
deeper into  
your project.  
The Raspberry  
Pi's most  
famous feature  
is its**

Acces PDF

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**adaptability.  
It can be used  
for thousands  
of electronic  
applications,  
and using the  
Linux OS  
expands the  
functionality  
even more. This  
book helps you  
get the most  
from your**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**Raspberry Pi,  
but it also  
gives you the  
fundamental  
engineering  
skills you need  
to incorporate  
any electronics  
into any  
project.**

**Develop the  
Linux and  
programming**

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**skills you need  
to build basic  
applications**

**Build your  
inventory of**

**parts so you  
can always**

**"make it work"**

**Understand  
interfacing,  
controlling,  
and**

**communicating**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**with almost any  
component**

**Explore**

**advanced**

**applications**

**with video,**

**audio, real-**

**world**

**interactions,**

**and more Be**

**free to adapt**

**and create with**

**Exploring**

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**Raspberry Pi.  
'... a very  
good balance  
between the  
theory and  
practice of  
real-time  
embedded system  
designs.'** –Jun-  
ichiro itojun  
Hagino, Ph.D.,  
Research  
Laboratory,

Acces PDF  
Embedded  
Systems Real  
**Internet**  
**Time Interfacing**  
**Initiative**  
To The Msp432  
Japan Inc.,  
Microcontroller  
**IETF IPv6**  
**Volume 2**  
**Operations**  
**Working Group**  
**(v6ops) co-**  
**chair 'A cl**  
**Real-Time**  
**Systems**  
**Development**  
**introduces**  
**computing**



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**students and professional programmers to the development of software for real-time applications. Based on the academic and commercial experience of the author, the book is an**

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Volume 2 in the

area of real-

time systems

design and

implementation.

Assuming a

certain level

of general

systems design

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Time Interfacing

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Microcontroller

Volume 2

**and programming  
experience,  
this text will  
extend  
students'  
knowledge and  
skills into an  
area of  
computing which  
has increasing  
relevance in a  
modern world of  
telecommunicati**

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Systems Real

**ons and**

**'intelligent'**

**equipment using**

**embedded microc**

**ontrollers.**

**This book takes**

**a broad,**

**practical**

**approach in**

**discussing real-**

**time systems.**

**It covers**

**topics such as**

Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**basic input and  
output; cyclic  
executives for  
bare hardware;  
finite state  
machines; task  
communication  
and synchroniza-  
tion;  
input/output  
interfaces;  
structured  
design for real-**

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**time systems;  
designing for  
multitasking;  
UML for real-  
time systems;  
object oriented  
approach to  
real-time  
systems;  
selecting  
languages for  
RTS  
development;**

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Systems Real

Time Interfacing

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Microcontroller

Volume 2

**Linux device  
drivers; and ha  
rdware/software  
co-design.**

**Programming  
examples using  
GNU/Linux are  
included, along  
with a  
supporting  
website  
containing  
slides;**

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Time Interfacing

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Volume 2

**solutions to  
problems; and  
software  
examples. This  
book will  
appeal to  
advanced  
undergraduate  
Computer  
Science  
students; MSc  
students; and,  
undergraduate**



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Microcontroller

Volume 2 \*  
students. \*

Concise

treatment

delivers

material in

manageable

sections \*

Includes handy

glossary,

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2 \*

**Supporting**

**website**

**contains**

**slides,**

**solutions to**

**problems and**

**software**

**examples**

Acces PDF

Embedded

Systems Real

**Rugged Embedded**

**Time Interfacing**

**Systems:**

**To The Msp432**

**Microcontroller**

**Volume 2**

**describes how**

**to design**

**reliable**

**embedded**

**systems for**

**harsh**

**environments,**

**including**

Acces PDF

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Time Interfacing

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Microcontroller

Volume 2

**architectural approaches, cross-stack hardware/software techniques, and emerging challenges and opportunities.**

**A "harsh environment" presents inherent characteristics, such**

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**as extreme  
temperature and  
radiation  
levels, very  
low power and  
energy budgets,  
strict fault  
tolerance and  
security  
constraints,  
etc. that  
challenge the  
computer system**

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Time Interfacing

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Microcontroller

Volume 2

**in its design  
and operation.**

**To guarantee  
proper**

**execution**

**(correct, safe,  
and low-power)**

**in such**

**scenarios, this  
contributed**

**work discusses**

**multiple layers**

**that involve**

Acces PDF  
Embedded  
Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

**firmware,  
operating  
systems, and  
applications,  
as well as  
power  
management  
units and  
communication  
interfaces.  
This book also  
incorporates  
use cases in**

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Microcontroller

Volume 2

**the domains of  
unmanned  
vehicles  
(advanced cars  
and micro  
aerial robots)  
and space  
exploration as  
examples of  
computing  
designs for  
harsh  
environments.**



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Volume 2

**Provides a deep understanding of embedded systems for harsh environments by experts involved in state-of-the-art autonomous vehicle-related projects Covers the most**

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Microcontroller

Volume 2

**important  
challenges  
(fault  
tolerance,  
power  
efficiency, and  
cost  
effectiveness)  
faced when  
developing  
rugged embedded  
systems  
Includes case**

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**studies**

Time Interfacing

**exploring**

To The Msp432

**embedded**

Microcontroller

**computing for**

Volume 2

**autonomous**

**vehicle systems**

**(advanced cars**

**and micro**

**aerial robots)**

**and space**

**exploration**

**Real-Time**

**Systems**

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Time Interfacing  
**Development  
Motorola 6811  
and 6812  
Simulation  
Introduction to  
Robotics  
Embedded and  
Real-Time  
Operating  
Systems  
Introduction to  
the ARM®  
Cortex(TM)-M Mi**

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

**Microcontrollers  
Real-Time  
Concepts for  
Embedded  
Systems**

Authored by two of the leading authorities in the field, this guide offers readers the knowledge and skills needed to achieve proficiency with embedded software.

This practical new book

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Time Interfacing

To The Mar432

Microcontroller

Volume 2

provides much-needed, practical, hands-on experience capturing analysis and design in UML. It holds the hands of engineers making the difficult leap from developing in C to the higher-level and more robust Unified Modeling Language, thereby supporting professional development for

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Volume 2

engineers looking to broaden their skill-sets in order to become more saleable in the job market. It provides a laboratory environment through a series of progressively more complex exercises that act as building blocks, illustrating the various aspects of UML and its application to real-time and embedded systems.

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With its focus on gaining proficiency, it goes a significant step beyond basic UML overviews, providing both comprehensive methodology and the best level of supporting exercises available on the market. Each exercise has a matching solution which is thoroughly explained step-by-step in the back



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of the book. The techniques used to solve these problems come from the author's decades of experience designing and constructing real-time systems. After the exercises have been successfully completed, the book will act as a desk reference for engineers, reminding them of how many of

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Time Interfacing

To The Mar430

Microcontroller

Volume 2

the problems they face  
in their designs can be  
solved. Tutorial style  
text with keen focus on  
in-depth presentation  
and solution of real-  
world example  
problems Highly  
popular, respected and  
experienced author  
This book covers the  
basic concepts and  
principles of operating  
systems, showing how

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Volume 2

to apply them to the design and implementation of complete operating systems for embedded and real-time systems. It includes all the foundational and background information on ARM architecture, ARM instructions and programming, toolchain for developing programs, virtual

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Volume 2

machines for software implementation and testing, program execution image, function call conventions, run-time stack usage and link C programs with assembly code. It describes the design and implementation of a complete OS for embedded systems in incremental steps,

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Microcontroller

Symmetric

Multiprocessing (SMP)

embedded systems, the

author examines the

ARM MPcore

processors, which

include the SCU and

GIC for interrupts

routing and

interprocessor

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To The Map432

Microcontroller

(SGIs). Throughout the

book, complete working

sample systems

demonstrate the design

principles and

implementation

techniques. The content

is suitable for advanced-

level and graduate

students working in

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software engineering,

programming, and

systems theory.

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Systems: Real Time

InterfacingCengage

Learning

Real-Time Operating

Systems Book 2 - the

Practice

Interfacing PIC

Microcontrollers

Software Engineering

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Embedded  
Systems Real  
Time Interfacing  
The Mpx423  
Microcontroller  
Distributed, Embedded  
and Real-time Java  
Systems  
Rugged Embedded  
Systems

*IMPORTANT: This  
is a rebadged  
version of Real-  
time Operating*



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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

*Systems, Book  
1, The Theory  
which (so far)  
has received  
eleven 5-star,  
one 4-star and  
one 3-star  
reviews. This  
book deals with  
the  
fundamentals of  
operating  
systems for use*

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

*in real-time  
embedded  
systems. It is  
aimed at those  
who wish to  
develop RTOS-  
based designs,  
using either  
commercial or  
free products.  
It does not set  
out to give you  
a knowledge to*

Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

*design an RTOS;  
leave that to  
the  
specialists.*

*The target  
readership  
includes:-  
Students.-  
Engineers,  
scientists and  
mathematicians  
moving into  
software*

Acces PDF

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Systems Real

*systems.-*

Time Interfacing

To The Msp432

Microcontroller

Volume 2

*entering the*

*embedded*

*field.-*

*Programmers*

*having little*

*or no formal*

*education in*

*the underlying*

Acces PDF

Embedded

Systems Real

*principles of  
software-based*

*real-time*

*systems. The*

*material covers*

*the key 'nuts*

*and bolts' of*

*RTOS structures*

*and usage (as*

*you would*

*expect, of*

*course). In*

*many cases it*

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

*shows how these  
are handled by  
practical real-  
time operating  
systems. It  
also places  
great  
emphasises on  
ways to  
structure the  
application  
software so  
that it can be*

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Time Interfacing

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Volume 2

*effectively  
implemented  
using an RTOS.  
After studying  
this even the  
absolute  
beginner will  
see that it  
isn't  
particularly  
difficult to  
implement RTOS-  
based designs*

Acces PDF

Embedded

Systems Real

Time Interfacing

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Volume 2

*and should be  
confident to  
take on such  
work.*

*Research on  
real-time Java  
technology has  
been prolific  
over the past  
decade, leading  
to a large  
number of  
corresponding*



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*hardware and software solutions, and frameworks for distributed and embedded real-time Java systems. This book is aimed primarily at researchers in real-time embedded*

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Systems Real

*systems,*

Time Interfacing

*particularly*

To The Msp432

*those who wish*

Microcontroller

*to understand*

Volume 2

*the current*

*state of the*

*art in using*

*Java in this*

*domain. Much of*

*the work in*

*real-time*

*distributed,*

*embedded and*

# Acces PDF Embedded

Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

*real-time Java  
has focused on  
the Real-time  
Specification  
for Java (RTSJ)*

*as the  
underlying base  
technology, and  
consequently  
many of the  
Chapters in  
this book  
address issues*

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Systems Real

*with, or solve  
Time Interfacing  
To The Msp432  
Microcontroller*  
problems using,  
this framework.

Describes

*Volume 2*  
innovative

*techniques in:*

*scheduling,*

*memory*

*management,*

*quality of*

*service and*

*communication*

*systems*

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Systems Real

*supporting real-*

*Time Interfacing*

*time Java*

*To The Msp432;*

*Microcontroller*

*Includes*

*Volume 2*  
*coverage of*

*multiprocessor*

*embedded*

*systems and*

*parallel*

*programming;*

*Discusses state-*

*of-the-art*

*resource*

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Embedded

Systems Real

*management for*

Time Interfacing

*embedded*

To The Msp432

*systems,*

Microcontroller

*including*

Volume 2

*Java's real-*

*time garbage*

*collection and*

*parallel*

*collectors;*

*Considers*

*hardware*

*support for the*

*execution of*

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Time Interfacing

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*accelerators;*

*Includes*

*coverage of*

*Safety Critical*

*Java for*

*development of*

*safety critical*

*embedded*

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2:

*Introduction to  
ARM Cortex-M Mi  
crocontrollers,  
Volume 1, ISBN:  
978-1477508992,  
configured for  
specific use in  
EE319K*



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Microcontroller

Volume 2

*Introduction to  
Embedded  
Systems taught  
at the  
University of  
Texas at  
Austin. It is  
first edition,  
fourth  
printing,  
December 2017.  
The section  
numbers in this*

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Time Interfacing

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Microcontroller

Volume 2

book also  
specify the  
corresponding  
section in the  
original book.

*This first book  
is an*

*introduction to  
computers and*

*interfacing*

*focusing on*

*assembly*

*language and C*

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Embedded

Systems Real

*programming.*

Time Interfacing

*The second book*

To The Msp432

*Embedded*

Systems: Real-

Time

Volume 2

*Interfacing to*

*ARM Cortex-M Mi*

*crocontrollers*

*focuses on hard*

*ware/software*

*interfacing and*

*the design of*

*embedded*

Acces PDF

Embedded

Systems Real

*systems. The*

*third book*

*Embedded*

*Systems: Real-*

*Time Operating*

*Systems for ARM*

*Cortex-M Microc*

*ontrollers is*

*an advanced*

*book focusing*

*on operating*

*systems, high-*

*speed*

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

*interfacing,  
control  
systems, and  
robotics. The  
third volume  
could also be  
used for  
professionals  
wishing to  
design or  
deploy a real-  
time operating  
system onto an*

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Volume 2

ARM platform.  
There is a web  
site  
accompanying  
this book <http://users.ece.utexas.edu/~valvano/arm>.  
Posted  
here are ARM  
Keil uVision  
and Texas  
Instruments  
Code Composer

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*Studio projects for each of the example programs in the book.*

*This Expert Guide gives you the knowledge, methods and techniques to develop and manage embedded systems*

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Systems Real

*successfully.*

*Time Interfacing*

*To The Msp432*

*Microcontroller*

*Volume 2*

*procedures, and*

*program*

*management*

*require unique*

*and wide*

*ranging skills*

*to develop a*

*system, skills*

*that most*



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Systems Real

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Volume 2 you

*will:*

*Understand the*

*various*

*business*

*aspects of a*

*project from*

*budgets and*

*schedules*

Access PDF  
Embedded  
Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

*through  
contracts and  
market studies  
Understand the  
place and  
timing for  
simulations,  
bench tests,  
and prototypes,  
and understand  
the differences  
between various  
formal methods*

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*such as FMECA,  
FTA, ETA,  
reliability,  
hazard*

*analysis, and  
risk analysis*

*Learn general  
design concerns*

*such as the  
user interface,  
interfaces and  
partitioning,*

*DFM, DFA, DFT,*

Acces PDF

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Microcontroller

Volume 2

*tradeoffs such  
as hardware  
versus  
software, buy  
versus build,  
processor  
choices, and  
algorithm  
choices,  
acquisition  
concerns, and  
interactions  
and comparisons*

Acces PDF  
Embedded  
Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

*between  
electronics,  
functions,  
software,  
mechanics,  
materials,  
security,  
maintenance,  
and support  
Covers the life  
cycle for  
developing an  
embedded*

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Embedded

Systems Real

*system: program*

*management,*

*procedures for*

*design and*

*development,*

*manufacturing,*

*maintenance,*

*logistics, and*

*legal issues*

*Includes proven*

*and practical*

*techniques and*

*advice on*

Acces PDF

Embedded

Systems Real

*tackling*

Time Interfacing

*critical issues*

To The Msp432

*reflecting the*

Microcontroller

*authors'*

Volume 2  
*expertise*

*developed from*

*years of*

*experience*

*Real-Time*

*Software Design*

*for Embedded*

*Systems*

*Using Web*

*Page 159/327*

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Systems Real

*Technologies to  
Build Connected*

*To The Msp432  
Devices*

*Handbook of*

*Real-Time and*

*Embedded*

*Systems*

*Introduction to*

*Embedded*

*Systems*

*Analog*

*Interfacing to*

*Embedded*



Acces PDF  
Embedded  
Systems Real  
Time Interfacing  
Microprocessor  
Systems  
With C and GNU  
Development  
Tools

**Interfacing PIC  
Microcontrollers  
, 2nd Edition is  
a great  
introductory  
text for those  
starting out in**

Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***this field and as  
a source  
reference for  
more  
experienced  
engineers.***

***Martin Bates  
has drawn upon  
20 years of  
experience of  
teaching  
microprocessor***

Acces PDF

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***systems to  
produce a book  
containing an  
excellent  
balance of  
theory and  
practice with  
numerous  
working  
examples  
throughout. It  
provides***

Acces PDF

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**comprehensive  
coverage of  
basic  
microcontroller  
system  
interfacing  
using the latest  
interactive  
software,  
Proteus VSM,  
which allows  
real-time**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***simulation of  
microcontroller  
based designs  
and supports  
the  
development of  
new  
applications  
from initial  
concept to final  
testing and  
deployment.***

Acces PDF

Embedded

Systems Real

**Comprehensive  
introduction to  
interfacing 8-bit  
PIC**

**microcontrollers**

**Designs**

**updated for**

**current**

**software**

**versions MPLAB**

**v8 & Proteus**

**VSM v8**

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***Additional  
applications in  
wireless  
communications  
, intelligent  
sensors and  
more***

***This book  
integrates new  
ideas and topics  
from real time  
systems,***

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***embedded systems, and software engineering to give a complete picture of the whole process of developing software for real-time embedded applications.***



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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***You will not only  
gain a thorough  
understanding  
of concepts  
related to  
microprocessors  
, interrupts, and  
system boot  
process,  
appreciating the  
importance of  
real-time***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***modeling and scheduling, but you will also learn software engineering practices such as model documentation, model analysis, design patterns, and standard conformance.***

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To The Msp432

Microcontroller

Volume 2

***This book is split into four parts to help you learn the key concept of embedded systems; Part one introduces the development process, and includes two***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**chapters on  
microprocessors  
and interrupts---  
fundamental  
topics for  
software  
engineers; Part  
two is dedicated  
to modeling  
techniques for  
real-time  
systems; Part**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***three looks at the design of software architectures and Part four covers software implementations, with a focus on POSIX-compliant operating systems. With***

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***this book you  
will learn: The  
pros and cons of  
different  
architectures  
for embedded  
systems POSIX  
real-time  
extensions, and  
how to develop  
POSIX-compliant  
real time***

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Systems Real

**applications**

**How to use real-**

**time UML to**

**document**

**system designs**

**with timing**

**constraints The**

**challenges and**

**concepts**

**related to cross-**

**development**

**Multitasking**

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

**design and inter-  
task**

**communication  
techniques**

**(shared memory  
objects,**

**message**

**queues, pipes,**

**signals) How to**

**use kernel**

**objects (e.g.**

**Semaphores,**



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Embedded  
Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

**Mutex,  
Condition  
variables) to  
address  
resource  
sharing issues  
in RTOS  
applications The  
philosophy  
underpinning  
the notion of  
"resource**

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***manager" and  
how to  
implement a  
virtual file  
system using a  
resource  
manager The  
key principles of  
real-time  
scheduling and  
several key  
algorithms***

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Microcontroller

Volume 2

***Coverage of the latest UML standard (UML 2.4) Over 20 design patterns which represent the best practices for reuse in a wide range of real-time embedded systems***

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To The Msp432

Microcontroller

Volume 2

***Example codes  
which have  
been tested in  
QNX---a real-  
time operating  
system widely  
adopted in  
industry***

***"This fifth  
edition includes  
the new TM4C12  
94-based***

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Systems Real

**LaunchPad.**

Time Interfacing

To The Msp432

**code in the book**

Microcontroller

Volume 2

**the**

**TM4C123-based**

**LaunchPad ...**

**This fifth edition**

**switches the**

**syntax from C to**

**the industry-**

**standard C99.**

**standard C99.**

Acces PDF

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Systems Real

**"--Page ix.**

***In this new***

***edition the***

***latest ARM***

***processors and***

***other hardware***

***developments***

***are fully***

***covered along***

***with new***

***sections on***

***Embedded Linux***

***Embedded Linux***

***Embedded Linux***

***Embedded Linux***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***and the new  
freeware  
operating  
system eCOS.***

***The hot topic of  
embedded  
systems and the  
internet is also  
introduced. In  
addition a  
fascinating new  
case study***

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Time Interfacing

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Microcontroller

Volume 2

***explores how  
embedded  
systems can be  
developed and  
experimented  
with using  
nothing more  
than a standard  
PC. \* A practical  
introduction to  
the hottest  
topic in modern***



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Systems Real

**electronics**

**design \* Covers**

**hardware,**

**interfacing and**

**programming in**

**one book \* New**

**material on**

**Embedded Linux**

**for embedded**

**internet**

**systems**

**Real-Time**

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

Computing in

Harsh

Environments

Developing and

Managing

Embedded

Systems and

Products

Real Time UML

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Systems Real

**Workshop for**

**Embedded**

**Systems**

**Interfacing,**

**Simulation, and**

**LabVIEW GUI**

**Embedded**

**Systems**

**Architecture**

**This book,**

**published**

**November 2015**

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**Page 187/327**

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**Page 187/327**

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Time Interfacing

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Microcontroller

Volume 2

***as a 1st edition  
1st printing, is  
the second in a  
series of three  
books that teach  
the fundamentals  
of embedded  
systems as  
applied to  
MSP432  
microcontrollers.  
These books are***

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Volume 2

***primarily written for undergraduate electrical and computer engineering students. They could also be used for professionals learning the ARM platform. The first***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***book Embedded  
Systems:  
Introduction to  
the MSP432 is an  
introduction to  
computers and  
interfacing  
focusing on  
assembly  
language and C  
programming.***

***This second book***

Acces PDF

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Systems Real

***focuses on***

***interfacing and***

***the design of***

***embedded***

***systems. The***

***third book***

***Embedded***

***Systems: Real-***

***Time Operating***

***Systems for ARM***

***Cortex-M***

***Microcontrollers***

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Time Interfacing

To The Msp432

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Volume 2

***is an advanced book focusing on operating systems, high-speed***

***interfacing, control systems, and robotics. An***

***embedded system is a system that performs a***



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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***specific task and  
has a computer  
embedded inside.***

***A system is  
comprised of  
components and  
interfaces  
connected  
together for a  
common  
purpose. This  
book presents***

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Systems Real

*components,*  
*interfaces and*

*methodologies*  
*for building*

*systems. Specific*

*topics include the*

*architecture of*

*microcontrollers,*

*design*

*methodology,*

*verification, hard*

*ware/software*

*ware/software*

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***synchronization,  
interfacing  
devices to the  
computer, timing  
diagrams, real-  
time systems,  
data collection  
and processing,  
motor control,  
analog filters,  
digital filters, real-  
time signal***

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Systems Real

*processing,*

*wireless*

*communication,*

*low-power*

*design, and the*

*internet of things.*

*In general, the*

*area of*

*embedded*

*systems is an*

*important and*

*growing*

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***discipline within electrical and computer engineering. The educational market of embedded systems has been dominated by simple microcontrollers like the PIC, the***

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***9S12, and the  
8051. This is  
because of their  
market share, low  
cost, and  
historical  
dominance.***

***However, as  
problems  
become more  
complex, so must  
the systems that***

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To The Msp432

Microcontroller

Volume 2

***solve them. A number of embedded system paradigms must shift in order to accommodate this growth in complexity. First, the number of calculations per second will***

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Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

***increase from  
millions/sec to  
billions/sec.***

***Similarly, the  
number of lines  
of software code  
will also increase  
from thousands  
to millions.***

***Thirdly, systems  
will involve  
multiple***



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Microcontroller

Volume 2

***microcontrollers  
supporting many  
simultaneous  
operations.***

***Lastly, the need  
for system  
verification will  
continue to grow  
as these systems  
are deployed into  
safety critical  
applications.***

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***These changes are more than a simple growth in size and bandwidth. These systems must employ parallel programming, high-speed synchronization, real-time operating***

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Microcontroller

Volume 2

***systems, fault tolerant design, priority interrupt handling, and networking.***

***Consequently, it will be important to provide our students with these types of design***

***experiences. The***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***purpose of  
writing these  
books at this time  
is to bring  
engineering  
education into  
the 21st century.***

***This book  
employs many  
approaches to  
learning. It will  
not include an***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***exhaustive  
recapitulation of  
the information in  
data sheets. First,  
it begins with  
basic  
fundamentals,  
which allows the  
reader to solve  
new problems  
with new  
technology.***

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Volume 2

***Second, the book presents many detailed design examples. These examples illustrate the process of design. There are multiple structural components that assist learning.***

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Microcontroller

Volume 2

***Checkpoints, with answers in the back, are short easy to answer questions providing immediate feedback while reading. The book includes an index and a glossary so that***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***information can  
be searched. The  
most important  
learning  
experiences in a  
class like this are  
of course the  
laboratories.***

***Each chapter has  
suggested lab  
assignments.***

***More detailed lab***



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Microcontroller

Volume 2

***descriptions are available on the web. Specifically, look at the lab assignments for EE445L and EE445M. These books will cover embedded systems for ARM Cortex-M microcontrollers***

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To The Msp432

Microcontroller

Volume 2

***with specific details on the MSP432.***

***Although the solutions are specific for the MSP432, it will be possible to use these books for other ARM derivatives.***

***Volume 3 can be***

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***used for either  
the TM4C or  
MSP432 families.***

***Analog***

***Interfacing to***

***Embedded***

***Microprocessors***

***addresses the***

***technologies and***

***methods used in***

***interfacing***

***analog devices to***

Acces PDF

Embedded

Systems Real

***microprocessors,***

***providing in-***

***depth coverage***

***of practical***

***control***

***applications, op***

***amp examples,***

***and much more.***

***A companion to***

***the author's***

***popular***

***Embedded***

***Microcontroller***

***Volume 2***

***applications, op***

***amp examples,***

***and much more.***

***A companion to***

***the author's***

***popular***

***Embedded***

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***Microprocessor  
Systems: Real  
World Design,  
this new  
embedded  
systems book  
focuses on  
measurement  
and control of  
analog quantities  
in embedded  
systems that are***

Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***required to  
interface to the  
real world. At a  
time when  
modern  
electronic  
systems are  
increasingly  
digital, a  
comprehensive  
source on  
interfacing the***

Acces PDF

Embedded

Systems Real

*real world to*

Time Interfacing

*microprocessors*

To The Msp432

*should prove*

Microcontroller

*invaluabe to*

Volume 2

*embedded*

*systems*

*engineers,*

*students,*

*technicians, and*

*hobbyists.*

*Anyone involved*

*in connecting the*

Acces PDF

Embedded

Systems Real

***analog***

***environment to***

***their digital***

***machines, or***

***troubleshooting***

***such connections***

***will find this book***

***especially useful.***

***Stuart Ball is also***

***the author of***

***Debugging***

***Embedded***



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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***Microprocessor  
Systems, both  
published by  
Newnes.***

***Additionally,  
Stuart has written  
articles for  
periodicals such  
as Circuit Cellar  
INK, Byte, and  
Modern  
Electronics. \****

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***Provides hard-to-***

***find information***

***on interfacing***

***analog devices***

***and technologies***

***to the purely***

***digital world of***

***embedded***

***microprocessors***

***\* Gives the***

***reader the insight***

***and perspective***

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***of a real  
embedded  
systems design  
engineer,  
including tips  
that only a hands-  
on professional  
would know \****

***Covers important  
considerations  
for both hardware  
and software***

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Systems Real  
Time Interfacing  
To The Msp432  
Microcontroller  
Volume 2

**systems when  
linking analog  
and digital  
devices**

***The solutions in  
this book are for  
educational  
purposes only.  
The programs  
and circuits in  
this manual have  
not been built or***

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Volume 2

***tested. They are provided without guarantee with respect to their accuracy. You are free to use the programs and circuits for either educational or commercial purposes, but please do not***

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Microcontroller

Volume 2

***post these answers on the web or distribute them to others.***

***Until the late***

***1980s,***

***information***

***processing was***

***associated with***

***large mainframe***

***computers and***

***huge tape drives.***

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Microcontroller

Volume 2

***During the 1990s, this trend shifted toward information processing with personal computers, or PCs. The trend toward miniaturization continues and in the future the***

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Microcontroller

Volume 2

***majority of information processing systems will be small mobile computers, many of which will be embedded into larger products and interfaced to the physical environment.***



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Microcontroller

Volume 2

**Hence, these kinds of systems are called embedded systems.**

**Embedded systems together with their physical environment are called cyber-physical**

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Systems Real

**systems.**

**Examples include**

**systems such as**

**transportation**

**and fabrication**

**equipment. It is**

**expected that the**

**total market**

**volume of**

**embedded**

**systems will be**

**significantly**

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Time Interfacing

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Volume 2

***larger than that of traditional information processing systems such as PCs and mainframes.***

***Embedded systems share a number of common characteristics.***

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Time Interfacing

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Microcontroller

Volume 2

***For example, they must be dependable, efficient, meet real-time***

***constraints and require***

***customized user interfaces***

***(instead of***

***generic keyboard and mouse***

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Systems Real

**interfaces).**

Time Interfacing

**Therefore, it**

To The Msp432

**makes sense to**

Microcontroller

**consider**

Volume 2

**common**

**principles of**

**embedded**

**system design.**

**Embedded**

**System Design**

**starts with an**

**introduction into**

Acces PDF

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Time Interfacing

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Volume 2

***the area and a survey of specification models and languages for embedded and cyber-physical systems. It provides a brief overview of hardware devices used for such***

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Time Interfacing

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Volume 2

***systems and presents the essentials of system software for embedded systems, like real-time operating systems. The book also discusses evaluation and validation***

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Time Interfacing

To The Msp432

Microcontroller

Volume 2

***techniques for  
embedded  
systems.***

***Furthermore, the  
book presents an***

***overview of  
techniques for  
mapping***

***applications to  
execution***

***platforms. Due to  
the importance of***



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Systems Real

**resource**

**efficiency, the**

**book also**

**contains a**

**selected set of**

**optimization**

**techniques for**

**embedded**

**systems,**

**including special**

**compilation**

**techniques. The**

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***book closes with  
a brief survey on  
testing.***

***Embedded  
System Design  
can be used as a  
text book for  
courses on  
embedded  
systems and as a  
source which  
provides pointers***

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Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***to relevant material in the area for PhD students and teachers. It assumes a basic knowledge of information processing hardware and software.***

**Courseware**

Page 235/327

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Systems Real

***related to this***

***book is available***

***at <http://ls12-www>***

***w.cs.tu-dortmund***

***.de/~marwedel.***

***Embedded***

***Systems Design***

***using the Rabbit***

***3000***

***Microprocessor***

***Methods,***

***Practical***

Acces PDF

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***Techniques, and  
Applications  
Interfacing,  
Networking, and  
Application***

***Development***

***Introduction to***

***Embedded***

***Microcomputer***

***Systems***

***Embedded***

***Microcomputer***

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Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

***Components and***

***Systems with***

***Linux and RTOS***

**An introduction to**

**the engineering**

**principles of**

**embedded**

**systems, with a**

**focus on modeling,**

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Systems Real

Time Interfacing

The Microcontroller

Volume 2

design, and

analysis of cyber-

physical systems.

The most visible

use of computers

and software is

processing

information for

human

consumption. The

vast majority of

computers in use,

however, are much

less visible. They

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Systems Real

Time Interfacing

The Map 40

Microcontroller

Volume 2

**run the engine, brakes, seatbelts, airbag, and audio system in your car. They digitally encode your voice and construct a radio signal to send it from your cell phone to a base station. They command robots on a factory floor, power generation**



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Systems Real

Time Interfacing

The Msp432

Microcontroller

Volume 2

**in a power plant,  
processes in a  
chemical plant,  
and traffic lights in  
a city. These less  
visible computers  
are called  
embedded  
systems, and the  
software they run  
is called embedded  
software. The  
principal  
challenges in**

Acces PDF

Embedded

Systems Real

**designing and  
analyzing**

Time Interfacing

**embedded systems**

stem from their

interaction with

**physical processes.**

**This book takes a**

**cyber-physical**

**approach to**

**embedded**

**systems,**

**introducing the**

**engineering**

**concepts**

Acces PDF

Embedded

Systems Real

Time Interfacing

To The Msp432

Microcontroller

Volume 2

**underlying  
embedded systems  
as a technology  
and as a subject of  
study. The focus is  
on modeling,  
design, and  
analysis of cyber-  
physical systems,  
which integrate  
computation,  
networking, and  
physical processes.  
The second edition**

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Systems Real

Time Interfacing

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Microcontroller

Volume 2

**offers two new chapters, several new exercises, and other improvements. The book can be used as a textbook at the advanced undergraduate or introductory graduate level and as a professional reference for practicing**

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Time Interfacing

For Ms/486

Microcontroller

Volume 2

**engineers and  
computer  
scientists. Readers  
should have some  
familiarity with  
machine  
structures,  
computer  
programming,  
basic discrete  
mathematics and  
algorithms, and  
signals and  
systems.**

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Systems Real

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To The Microcontroller

Volume 2

Offering

**comprehensive**

**coverage of the**

**convergence of**

**real-time**

**embedded systems**

**scheduling,**

**resource access**

**control, software**

**design and**

**development, and**

**high-level system**

**modeling, analysis**

**and verification**

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**Following an  
introductory  
overview, Dr.  
Wang delves into  
the specifics of  
hardware  
components,  
including  
processors,  
memory, I/O  
devices and  
architectures,  
communication  
structures,**

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**peripherals, and characteristics of real-time operating systems. Later chapters are dedicated to real-time task scheduling algorithms and resource access control policies, as well as priority-inversion control and deadlock**



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**avoidance.**

Time Interfacing

**Concurrent system  
programming and**

Tr. To M. p. 438  
Microcontroller

**POSIX  
programming for**

Volume 2  
**real-time systems**

**are covered, as are**

**finite state**

**machines and Time**

**Petri nets. Of**

**special interest to**

**software engineers**

**will be the chapter**

**devoted to model**

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**checking, in which the author discusses temporal logic and the NuSMV model checking tool, as well as a chapter treating real-time software design with UML. The final portion of the book explores practical issues of software reliability, aging,**

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Time, Interfacing  
The Msp432  
Microcontroller  
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**rejuvenation,  
security, safety,  
and power  
management. In  
addition, the book:  
Explains real-time  
embedded  
software modeling  
and design with  
finite state  
machines, Petri  
nets, and UML, and  
real-time  
constraints**

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Time Interfacing

Time Map,32

Microcontroller

Volume 2

**verification with  
the model  
checking tool,  
NuSMV Features  
real-world  
examples in finite  
state machines,  
model checking,  
real-time system  
design with UML,  
and more Covers  
embedded  
computer  
programing,**

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Volume 2

**designing for  
reliability, and  
designing for  
safety Explains  
how to make  
engineering trade-  
offs of power use  
and performance  
Investigates  
practical issues  
concerning  
software  
reliability, aging,  
rejuvenation,**

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**security, and**

Time Interfacing

**power**

management Real-

Time Embedded

Systems is a

valuable resource

for those

responsible for

real-time and

embedded

software design,

development, and

management. It is

also an excellent

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**textbook for  
graduate courses**

**in computer**

**engineering,**

**computer science,**

**information**

**technology, and**

**software**

**engineering on**

**embedded and real-**

**time software**

**systems, and for**

**undergraduate**

**computer and**

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Systems Real  
software  
Time Interfacing  
engineering  
courses. Msp432

**This textbook  
serves as an  
introduction to the  
subject of  
embedded systems  
design, using  
microcontrollers as  
core components.  
It develops  
concepts from the  
ground up,**



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**covering the  
development of**

**embedded systems**

**technology,**

**architectural and**

**organizational**

**aspects of**

**controllers and**

**systems, processor**

**models, and**

**peripheral devices.**

**Since microprocess**

**or-based**

**embedded systems**

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**tightly blend hardware and software components in a single application, the book also introduces the subjects of data representation formats, data operations, and programming styles. The practical**

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**component of the  
book is tailored  
around the  
architecture of a  
widely used Texas  
Instrument's  
microcontroller,  
the MSP430 and a  
companion web  
site offers for  
download an  
experimenter's kit  
and lab manual,  
along with**

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**Powerpoint slides  
and solutions for  
instructors.**

**This Expert Guide  
gives you the  
techniques and  
technologies in  
software**

**engineering to  
optimally design  
and implement  
your embedded  
system. Written by  
experts with a**

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**solutions focus,  
this encyclopedic**

**reference gives**

**you an**

**indispensable aid**

**to tackling the day-**

**to-day problems**

**when using**

**software**

**engineering**

**methods to**

**develop your**

**embedded**

**systems. With this**

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To TMs400

Microcontroller

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**book you will  
learn: The  
principles of good  
architecture for an  
embedded system  
Design practices to  
help make your  
embedded project  
successful Details  
on principles that  
are often a part of  
embedded  
systems, including  
digital signal**

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**processing, safety-**

**critical principles,**

**and development**

**processes**

**Techniques for**

**setting up a**

**performance**

**engineering**

**strategy for your**

**embedded system**

**software How to**

**develop user**

**interfaces for**

**embedded systems**

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**Strategies for  
testing and  
deploying your  
embedded system,  
and ensuring  
quality  
development  
processes Practical  
techniques for  
optimizing  
embedded  
software for  
performance,  
memory, and**



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power Advanced  
Time Interfacing  
guidelines for  
developing  
multicore software  
for embedded  
systems How to  
develop embedded  
software for  
networking,  
storage, and  
automotive  
segments How to  
manage the  
embedded

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development  
process Includes  
contributions from:

**Frank**

**Schirrmeister,**

**Shelly Gretlein,**

**Bruce Douglass,**

**Erich Styger, Gary**

**Stringham, Jean**

**Labrosse, Jim**

**Trudeau, Mike**

**Brogioli, Mark**

**Pitchford, Catalin**

**Dan Udma, Markus**

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**Levy, Pete Wilson,  
Whit Waldo, Inga  
Harris, Xinxin  
Yang, Srinivasa  
Addepalli, Andrew  
McKay, Mark  
Kraeling and  
Robert Oshana.  
Road map of key  
problems/issues  
and references to  
their solution in  
the text Review of  
core methods in**

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Volume 2

**the context of how  
to apply them**

**Examples**

**demonstrating**

**timeless**

**implementation**

**details Short and**

**to- the- point case**

**studies show how**

**key ideas can be**

**implemented, the**

**rationale for**

**choices made, and**

**design guidelines**

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**and trade-offs**

Time Interfacing

**Embedded System**

Interfacing p432

**Explore**

**architectural**

**concepts,**

**pragmatic design**

**patterns, and best**

**practices to**

**produce robust**

**systems**

**Arduino-Based**

**Embedded**

**Systems**

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W/cd  
Making Embedded  
Systems

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developing  
embedded  
systems? Since

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they don't tolerate inefficiency, these systems require a disciplined approach to programming. This easy-to-read guide helps you cultivate a host of good

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development

practices, based

on classic

software design

patterns and

new patterns

unique to

embedded

programming.

Learn how to

build system

architecture for



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processors, not  
operating  
systems, and  
discover specific  
techniques for  
dealing with  
hardware  
difficulties and  
manufacturing  
requirements.  
Written by an  
expert who's

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created

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systems ranging

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from urban

Volume 2  
surveillance and

DNA scanners to

children's toys,

this book is ideal

for intermediate

and experienced

programmers,

no matter what

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platform you  
use. Optimize  
your system to  
reduce cost and  
increase

performance

Develop an  
architecture that  
makes your  
software robust  
in resource-  
constrained

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environments  
Explore sensors,  
motors, and  
other I/O  
devices Do more  
with less: reduce  
RAM  
consumption,  
code space,  
processor  
cycles, and  
power

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consumption

Learn how to

update

embedded code

directly in the

processor

Discover how to

implement

complex

mathematics on

small processors

Understand

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what  
interviewers  
look for when  
you apply for an  
embedded  
systems job

"Making  
Embedded  
Systems is the  
book for a C  
programmer  
who wants to

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enter the fun  
(and lucrative)  
world of  
embedded  
systems. It's  
very well written  
—entertaining,  
even—and filled  
with clear  
illustrations."  
—Jack Ganssle,  
author and

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embedded  
system expert.  
This book is the  
first in a series  
of two books  
that teach the  
fundamentals of  
embedded  
systems as  
applied to the  
MSP432 of  
microcontroller.



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This first book is an introduction to computers and interfacing focusing on assembly language and C programming.

The second book Embedded Systems: Real-Time Interfacing

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to the MSP432  
Microcontroller  
focuses on hard  
ware/software  
interfacing and  
the design of  
embedded  
systems. This  
first book is an  
introductory  
book that could  
be used at the

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college level  
with little or no  
prerequisites.  
An embedded  
system is a  
system that  
performs a  
specific task and  
has a computer  
embedded  
inside. A system  
is comprised of

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components and  
interfaces  
connected  
together for a  
common

purpose. This  
book is an  
introduction to  
embedded  
systems.

Specific topics  
include

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microcontrollers,  
fixed-point  
numbers, the  
design of  
software in  
assembly  
language and C,  
elementary data  
structures,  
programming  
input/output  
including

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interrupts,  
analog to digital  
conversion,  
digital to analog  
conversion. This  
book employs  
many  
approaches to  
learning. It will  
not include an  
exhaustive  
recapitulation of

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the information  
in data sheets.

First, it begins  
with basic

fundamentals,

which allows the

reader to solve

new problems

with new

technology.

Second, the

book presents

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many detailed design examples. These examples illustrate the process of design. There are multiple structural components that assist learning.



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Checkpoints,  
with answers in  
the back, are  
short easy to  
answer  
questions  
providing  
immediate  
feedback while  
reading. Simple  
homework, with  
answers to the

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odd questions on the web, provides more detailed learning opportunities.

The book includes an index and a glossary so that information can be searched.

The most

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important  
learning  
experiences in a  
class like this  
are of course  
the laboratories.  
Each chapter  
has suggested  
lab assignments.  
More detailed  
lab descriptions  
are available on

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the web.

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look at the lab

assignments for

EE319K. For

Volume 2, refer

to the EE445L

labs. There is a

web site

accompanying

this book [http: //](http://)

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valvano/arm.

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and Texas

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Code Composer

Studio projects

for each of the

example

programs in the

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book. You will also find data sheets and Excel spreadsheets relevant to the material in this book. The book will cover embedded systems for ARM Cortex-M microcontrollers

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with specific  
details on the  
MSP432.

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provides an in-

depth discussion

of the design of

real-time

embedded

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systems using  
9512  
microcontrollers.  
This book covers  
the hardware  
aspects of  
interfacing,  
advanced  
software topics  
(including  
interrupts), and  
a systems



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approach to  
typical  
embedded  
applications.

This text stands  
out from other  
microcomputer  
systems books  
because of its  
balanced, in-  
depth treatment  
of both

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hardware and software issues important in real time embedded systems design.

It features a wealth of detailed case studies that demonstrate basic concepts in the context of

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actual working  
examples of  
systems. It also  
features a  
unique

simulation

software

package on the

bound-in CD-

ROM (called Test

Execute and

Simulate, or

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TExaS, for short)  
that provides a  
self-contained  
software  
environment for  
designing,  
writing,  
implementing,  
and testing both  
the hardware  
and software  
components of

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embedded  
systems.  
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Notice: Media  
content  
referenced  
within the  
product  
description or  
the product text  
may not be  
available in the

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ebook version.  
Embedded systems are a ubiquitous component of our everyday lives. We interact with hundreds of tiny computers every day that are embedded into

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our houses, our cars, our toys, and our work. As our world has become more complex, so have the capabilities of the microcontrollers embedded into our devices. The

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microcontroller

much more

powerful than

the devices

available ten

years ago. The

purpose of this

book is to



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present the design methodology to train young engineers to understand the basic building blocks that comprise devices like a cell phone, an MP3 player, a

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pacemaker,  
antilock brakes,  
and an engine  
controller. This  
book is the third  
in a series of  
three books that  
teach the  
fundamentals of  
embedded  
systems as  
applied to the

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ARM®

Cortex®-M3. This  
third volume is  
primarily written  
for senior

undergraduate

or first-year

graduate

electrical and

computer

engineering

students. It

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could also be used for professionals wishing to design or deploy a real-time operating system onto an Arm platform. The first book Embedded Systems:

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Introduction to  
the ARM Cortex-  
M3 is an

introduction to  
computers and  
interfacing

focusing on  
assembly

language and C  
programming.

The second book  
Embedded

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Systems: Real-Time Interfacing to the ARM Cortex-M3 focuses on interfacing and the design of embedded systems. This third book is an advanced book focusing on

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operating  
systems, high-  
speed  
interfacing,  
control systems,  
and robotics.  
Rather than  
buying and  
deploying an  
existing OS, the  
focus is on  
fundamental

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principles, so readers can write their-own OS. An embedded system is a system that performs a specific task and has a computer embedded inside. A system



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is comprised of components and interfaces connected together for a common purpose.

Specific topics include microcontrollers, design, verification, har

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hardware/software  
synchronization,  
interfacing  
devices to the  
computer, real-  
time operating  
systems, data  
collection and  
processing,  
motor control,  
analog filters,  
digital filters,

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and real-time  
signal  
processing. This  
book employs  
many

approaches to  
learning. It will  
not include an  
exhaustive  
recapitulation of  
the information  
in data sheets.

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First, it begins with basic fundamentals, which allows the reader to solve new problems with new technology.

Second, the book presents many detailed design

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examples. These examples illustrate the process of design. There are multiple structural components that assist learning.

Checkpoints, with answers in

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the back, are  
short easy to  
answer  
questions  
providing  
immediate  
feedback while  
reading. Simple  
homework, with  
answers to the  
odd questions  
on the web,

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provides more detailed learning opportunities.

The book includes an index and a glossary so that information can be searched.

The most important learning

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experiences in a class like this are of course the laboratories.

Each chapter has suggested lab assignments. More detailed lab descriptions are available on the web.

Specifically for



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Volume 1, look at the lab assignments for EE319K. For

Volume 2 refer to the EE445L labs, and for this volume, look at the lab

assignments for EE345M/EE380L.

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this book [http://](http://users.ece.utexas.edu/~valvano/arm)

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rm. Posted here

are Keil uVision

projects for each

the example

programs in the

book. You will

also find data

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sheets and Excel  
spreadsheets  
relevant to the  
material in this  
book. The book  
will cover  
embedded  
systems for the  
ARM®

Cortex®-M3 with  
specific details  
on the LM3S811,

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LM3S1968, and  
LM3S8962. Most  
of the topics can  
be run on the  
simple

LM3S811. DMA  
interfacing will  
be presented on  
the LM3S3748.  
Ethernet and  
CAN examples  
can be run on

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the LM3S8962.

In this book the  
term LM3Sxxx

family will refer  
to any of the

Texas

Instruments

Stellaris®

ARM® Cortex®-

M3-based

microcontrollers.

Although the

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solutions are specific for the LM3Sxxx family, it will be possible to use this book for other Arm derivatives.

Design for the Internet-of-Things (IoT) and Cyber-Physical

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Real-Time  
Interfacing to  
the Msp432  
Microcontroller  
Real-Time  
Operating  
Systems Book 1