Contents

Legal v

Acknowledgments vii

About the author ix

About the companion website xi

Preface to the First Edition xiii

Preface to the Third Edition xv

Introduction xvii

0.1 How is the Book Organized? xvii

0.2 Why Open-Source? xix

0.3 What will you learn? xx

0.4 Safety concerns xxi

0.5 Prerequisites xxii

1 Getting Started **1**

1.1 The Arduino Platform 1

1.2 What you Need to Know About Electronics 3

1.3 Your Very First Project: a Simple Alarm System 7

2 Building a Weather Measurement Station **13**

2.1 Hardware & Software Requirements 13

2.2 Hardware Configuration 15

2.3 Testing the Sensors 17

2.4 Displaying the Data on the LCD Screen 21

2.5 How to Go Further 26

3 Building a Smart Lamp **27**

3.1 Hardware & Software Requirements 27

3.2 Hardware Configuration 31

3.3 Testing the Relay 33

3.4 Power Measurements & Automatic Lighting Control 35

3.5 How to Go Further 44

4 XBee Motion Sensors **45**

4.1 Hardware & Software Requirements 46

4.2 Building an XBee Motion Sensor 49

4.3 Testing the Motion Sensor 50

4.4 Using the XBee Module 52

4.5 Building the Central Interface 57

4.6 How to Go Further 64

5 Bluetooth Weather Station **67**

5.1 Hardware & Software Requirements 67

5.2 Building the Bluetooth Weather Station 70

5.3 Pairing the Bluetooth Module 73

5.4 Remote Temperature Measurements 74

5.5 Building the Server Interface 81

5.6 How to Go Further 89

6 Controlling Lamps via WiFi **91**

6.1 Hardware & Software Requirements 91

6.2 Building the Project 95

6.3 Testing the WiFi Module 98

6.4 Remote Lamp Control 103

6.5 Building the Smart Lamp Interface 111

6.6 How to Go Further 121

7 Building an Home Automation System **123**

7.1 Hardware & Software Requirements 123

7.2 Building the Project 125

7.3 Testing the Modules 126

7.4 Building the Central Interface 134

7.5 How to Go Further 143

8 Conclusion **145**

8.1 What did you learn in this book? 145

8.2 How to go further? 146

9 Resources **151**

9.1 General Information about Arduino 151

9.2 Components 152

9.3 Suggested Reading 152