

EXPERIMENT MANUAL

GAMING • CODING • MAKING

# CODE GAMER

with KosmoBits

THAMES & KOSMOS



Franckh-Kosmos Verlags-GmbH & Co. KG, Pfizerstr. 5-7, 70184 Stuttgart, Germany | +49 (0) 711 2191-0 | [www.kosmos.de](http://www.kosmos.de)  
Thames & Kosmos, 301 Friendship St., Providence, RI, 02903, USA | 1-800-587-2872 | [www.thamesandkosmos.com](http://www.thamesandkosmos.com)  
Thames & Kosmos UK Ltd, Goudhurst, Kent, TN17 2QZ, United Kingdom | 01580 212000 | [www.thamesandkosmos.co.uk](http://www.thamesandkosmos.co.uk)

## &gt;&gt;&gt; KIT CONTENTS

**What's inside your experiment kit:**

**GOOD TO KNOW!** If you are missing any parts, please contact Thames & Kosmos customer service.  
 US: [techsupport@thamesandkosmos.com](mailto:techsupport@thamesandkosmos.com)  
 UK: [techsupport@thamesandkosmos.co.uk](mailto:techsupport@thamesandkosmos.co.uk)

**Checklist: Find – Inspect – Check off**

No.	Description	Quantity	Item No.
1	KosmoDuino	1	717 982
2	Interaction board	1	717 981
3	Gamepad housing, top right	1	718 006
4	Gamepad housing, top left	1	718 007
5	Gamepad housing, bottom	1	718 005
6	Wheel with return spring	1	718 008 718 009
7	Buttons with rubber feet	1	718 010 718 011
8	Light sensor	1	717 985
9	Sound sensor	1	717 986
10	Temperature sensor	1	717 984
11	Motion sensor	1	717 983
12	Housing for sound sensor	1	718 000 718 004
13	Housing for light sensor	1	717 999 718 003
14	Housing for temperature sensor	1	717 997 718 001

No.	Description	Quantity	Item No.
15	Housing for motion sensor	1	717 998 718 002
16	Breadboard	1	717 996
17	Jumper wires male-female	10	717 990
18	Jumper wires male-male	10	717 989
19	Resistors: 330 Ohm	5	717 991
20	LEDs: yellow green blue red	1 each	717 994 717 993 717 995 717 992
21	Cable: USB to Micro-USB	1	717 988
22	Lithium polymer battery, 800 mAh (not shown)	1	717 987

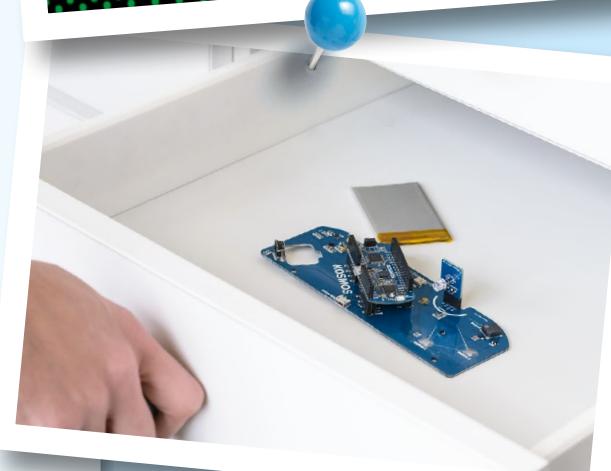
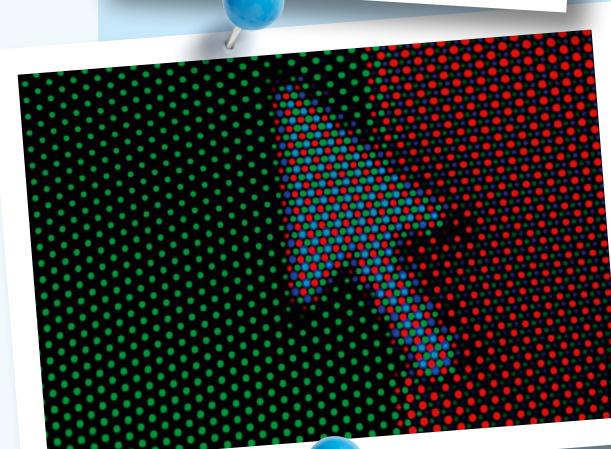
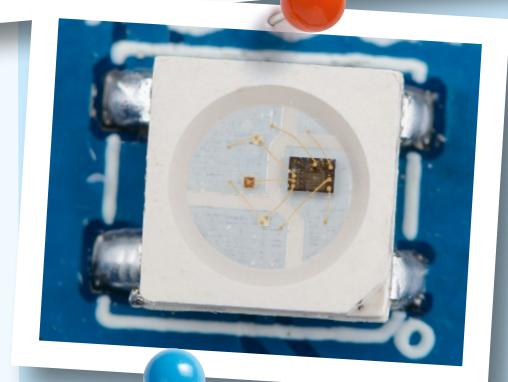
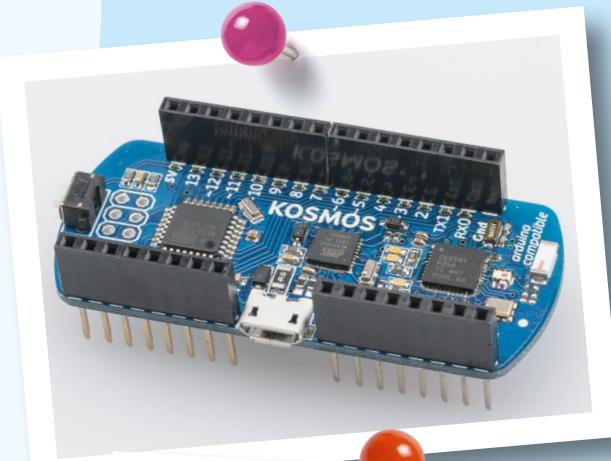
**You will also need:**

Smartphone or tablet with Android (4.3 or later) or iOS (Version 7 or later). The device must support Bluetooth 4 or higher. PC with Internet access.

1000 1001  
1101 101 00  
100 10  
1010  
0

## >>> TABLE OF CONTENTS

Safety Information .....	Inside front cover
Kit Contents.....	1
Table of Contents.....	2
How to get started with CodeGamer .....	3
Assembling the gamepad and sensors	
The CodeGamer app	
The World of the Microcontroller .....	6
First steps .....	8
Installation of the Arduino Software	
Project 1: Blink! .....	9
Upload a program to your KosmoDuino	
Project 2: Off switch .....	14
Project 3: On switch .....	15
The Interaction Board .....	17
Project 4: Colored light .....	18
Project 5: At the push of a button .....	22
Project 6: A blinking die .....	26
Project 7: Serial monitor .....	28
The for loop .....	30
Sensors .....	32
Project 8: Thermometer .....	33
Project 9: Finger disco .....	36
Project 10: Cheep! .....	38
Project 11: Random sounds! .....	39
Project 12: Siren .....	40
Project 13: Musical scale .....	43
Project 14: Sensor organ .....	44
Project 15: The serial plotter .....	46
Project 16: Clap switch .....	47
Project 17: Drawer monitor .....	48
Project 18: Looking inside the fridge .....	53
Project 19: Ghostly eyes .....	55
Common Error Messages .....	62
Notes .....	64
Publisher's Information .....	Inside back cover



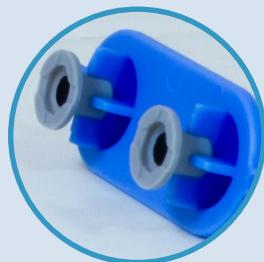
### TIP!

You will find additional information on the "Check It Out" pages (21, 59-61) and "Knowledge Base" pages (24-25, 35, 41-42, and 58).

5



5. Now you can insert the interaction board into the housing. Be sure that the wheel is mounted correctly in the spring (see image in circle).



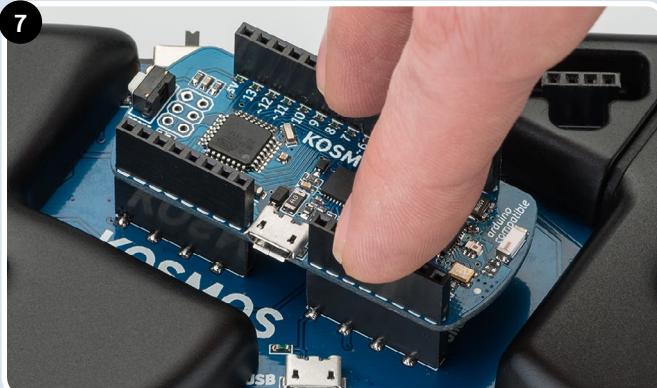
6



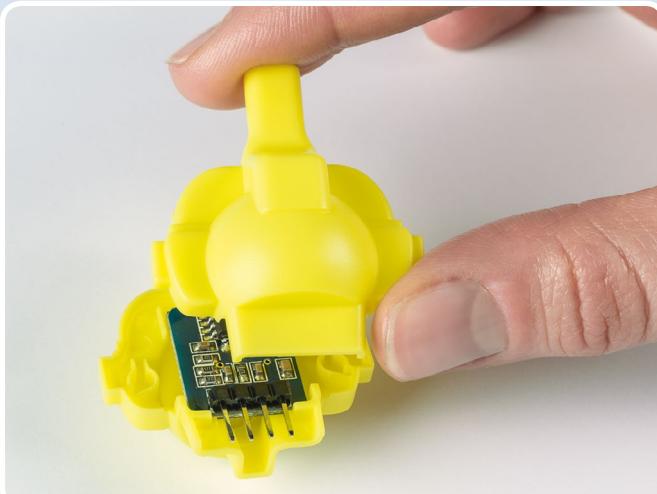
6. Attach the gray rubber feet onto the bottom of each button. To do this, simply insert the thinner side of the rubber foot into the recess on the bottom of the button.

Then, insert the button plate into the right upper gamepad housing. Be sure that the buttons are positioned correctly. You know that everything is correctly placed when you feel an explicit trigger point when the buttons are pushed. Then, attach the left upper housing.

7



7. Your gamepad is now completed except for its “control center,” the KosmoDuino. You can simply attach this to the interaction board. Make sure that all the pins fit and do not bend when you attach it. Press the KosmoDuino far enough in that its “feet” (the metal pins) are no longer visible.



## ASSEMBLING THE SENSORBOTS

1. Take one of the sensors and look for the housing with the matching color (see page 1, “Kit Contents”). Insert the sensor front side forward into the half of the housing with the eyes printed on it. The sensors’ “feet” (the metal pins) are always closer to the back side.
2. Now all you have to do is attach the rear of the housing to the front part. To do that, just press the two parts firmly together.



### SYSTEM REQUIREMENTS:

*KosmoBits supports devices with Android 4.3 and iOS 7 operating systems or later. The device has to support Bluetooth 4 or higher.*

## THE APP

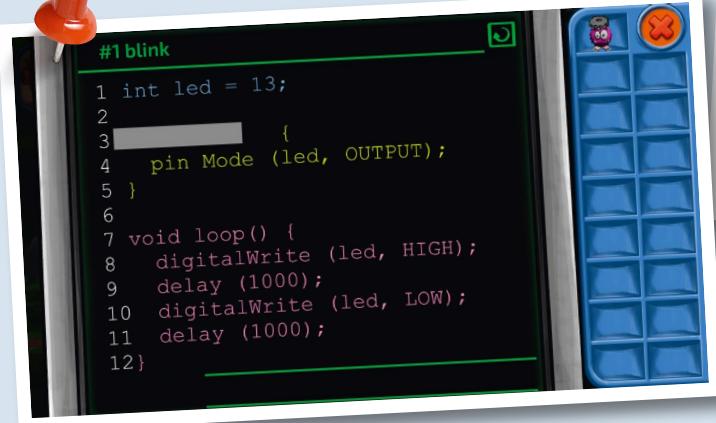
To ease your entry into the world of programming, we have developed an app to help you start building experience in this area.

The core of the app is a video game in which you have to solve little programming puzzles. But don't be afraid — they aren't hard, and you will definitely be able to figure them out. The key to solving the puzzles lies with the **code monsters** that you will find at every level. **Collect them all**, because you will need them at the **computer terminals**. The computer terminals contain incomplete code. To fill in the blanks, you will need to **drag the correct code monster into the matching blank spaces**. To learn more about the monsters, just **tap once or twice on them in your inventory** — and they will tell you which blank space in the code they will complete.

Use your gamepad to control the characters in the game. To do this, you must have **Bluetooth** activated on your tablet or smartphone. Start the app and switch on the gamepad by sliding the switch at the upper edge to the "ON" position. The connection will then be made automatically in a few seconds. Once the connection is active, the **control elements** (arrows and A and B buttons) will disappear from the screen and you can control the app with just the gamepad. If you switch off your gamepad, the control elements will reappear. But the game is not nearly as much fun without the gamepad!



**Important!** Take the time to read the information, tips, and hints presented in the communication console here.



◀▲ Various CodeGamer App screenshots