

EXPERIMENT MANUAL

GAMING ■ CODING ■ MAKING

CODE GAMER

with **KosmoBits**



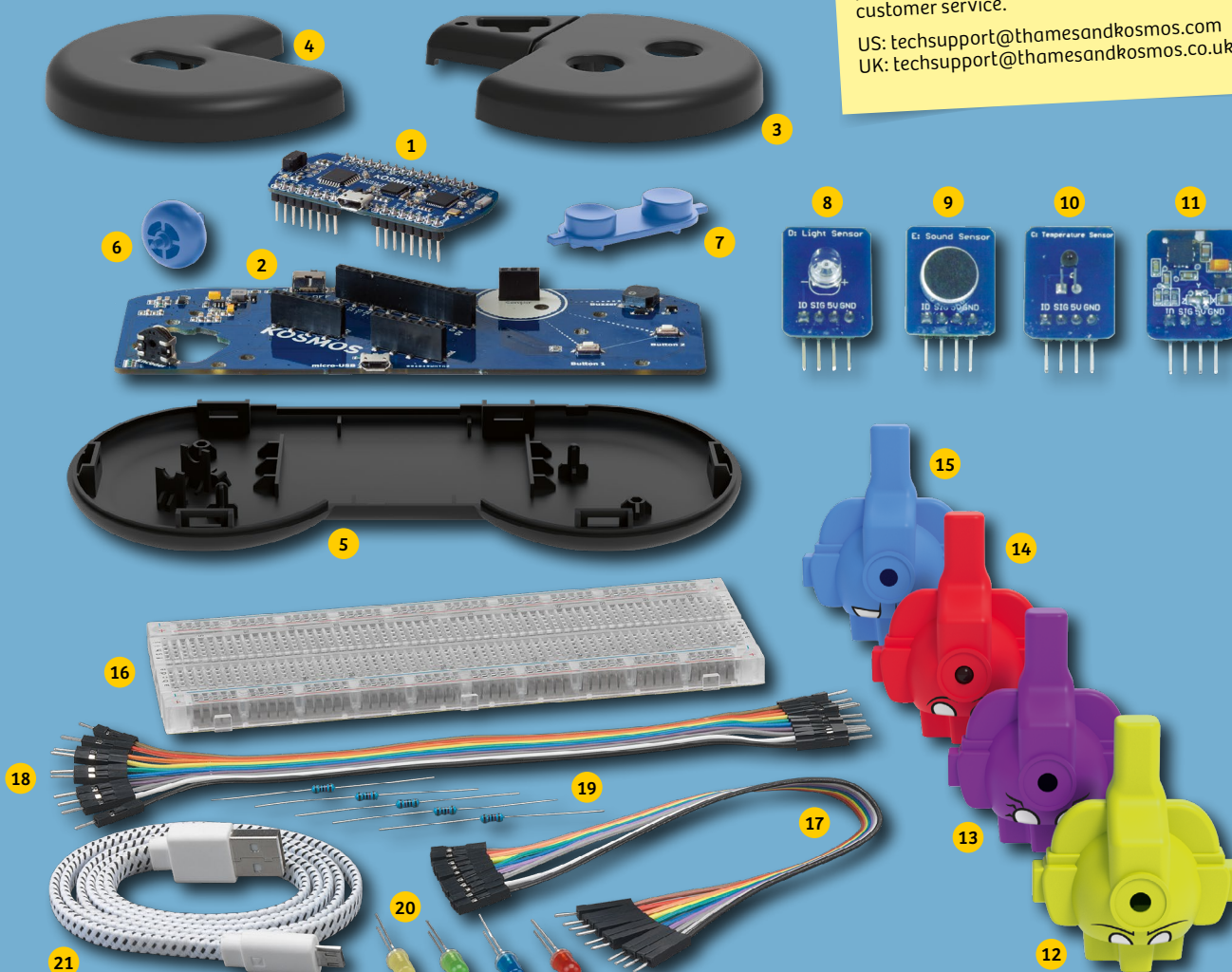
THAMES & KOSMOS

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

>>> 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
 UK: techsupport@thamesandkosmos.co.uk



Checklist: Find – Inspect – Check off

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

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

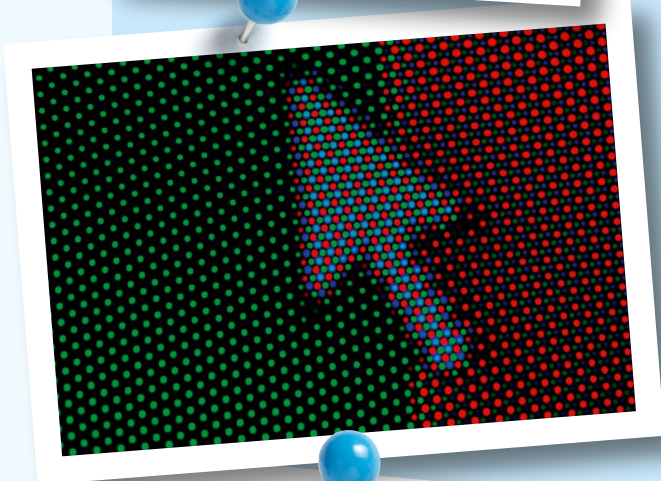
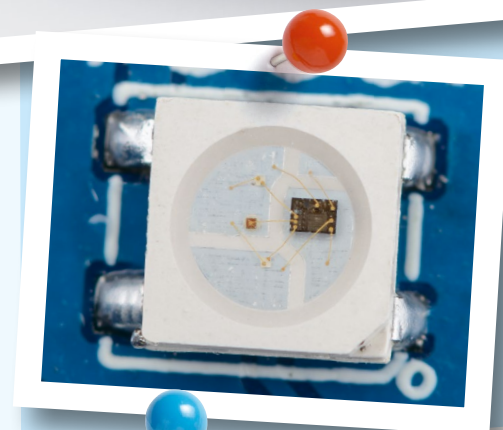
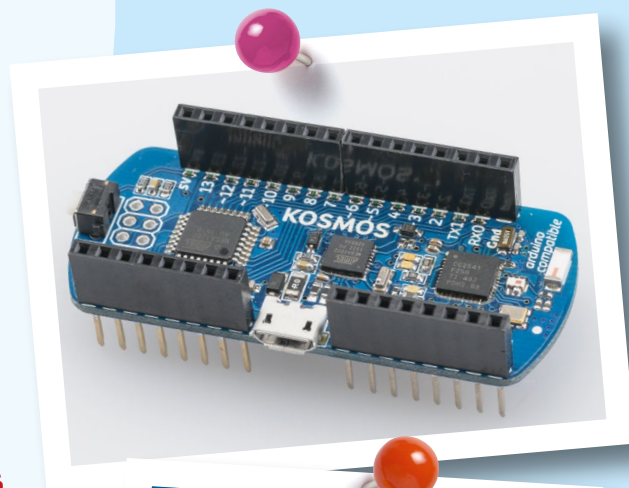
You will also need:

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!

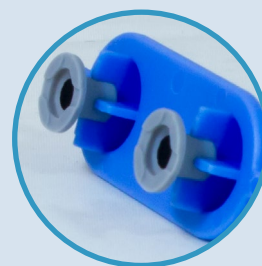
You will find additional information on the "Check It Out" pages (21, 59-61) and "Knowledge Base" pages (24-25, 35, 41-42, and 58).



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).



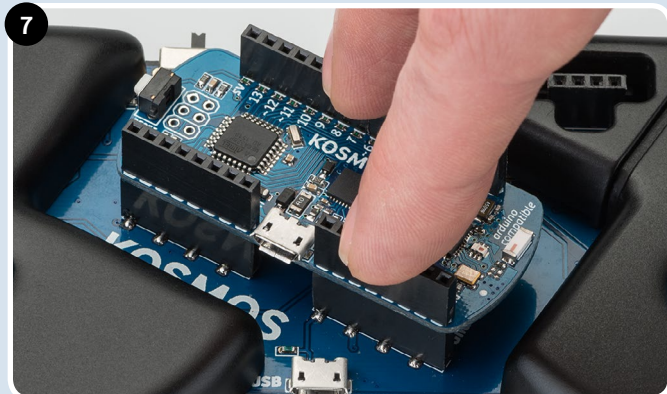
6



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.

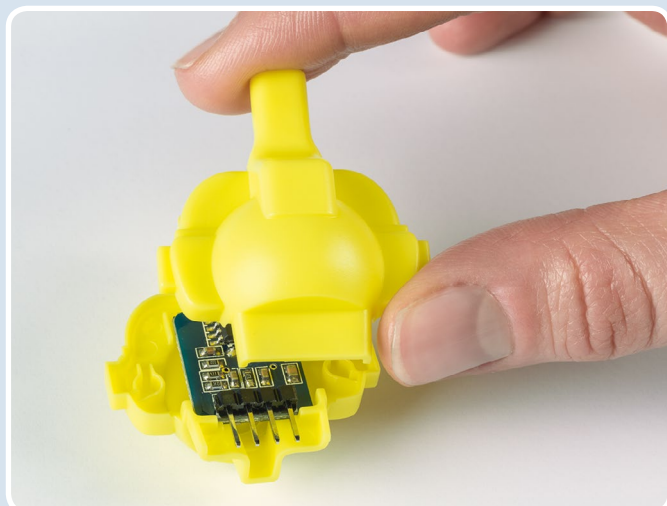
7



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

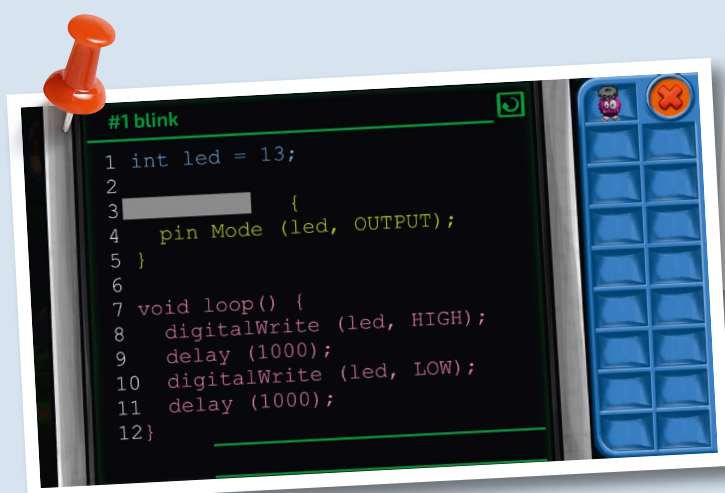
To ease your entry into the world of programming, we have developed an app to help you start building experience in this area.

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