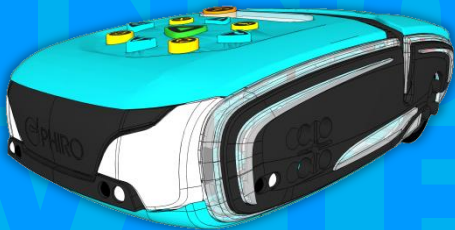




USER MANUAL V1.0



A robotic coding toy for young inventors & creators

ROBOTIX
U.S.A.

www.robotixedu.com
robotixusa@robotixedu.com



We thank all our Kickstarter Backers who have helped us bring Phiro to life.

SEPTEMBER 2016 EDITION

You can download the latest version of this manual on our website

www.robotixedu.com/phiro/downloads

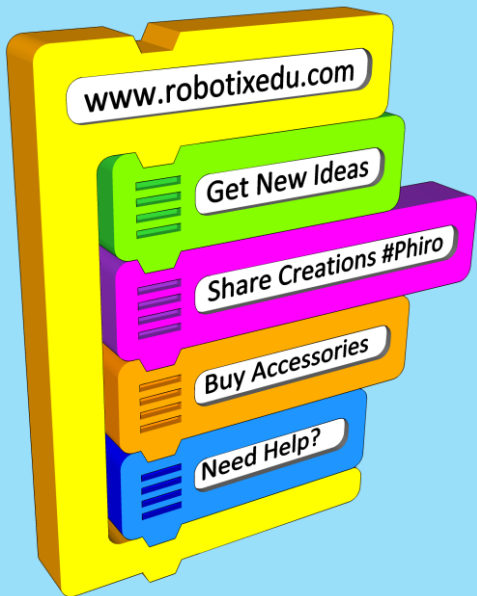


WARNING: CHOKING HAZARD – Small parts not for children under 3 years or any individuals who have a tendency to place inedible objects in their mouths.

INTRODUCTION

This user manual can be used for both **Phiro Unplugged** and **Phiro Pro** robots.

Features		Phiro Unplugged	Phiro Pro
LEGO® Compatibility		✓	✓
Sequential Mode	Without any device or computer	✓	✓
SWISH Card Mode		✓	✓
Scratch	Free, Open Source & Wireless via Bluetooth	✗	✓
Snap 4 Phiro		✗	✓
Pocket Code		✗	✓

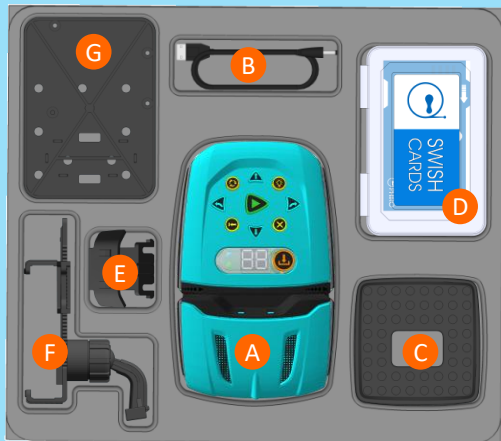


You can also email us at
robotixusa@robotixedu.com

I N D E X

What's in the Box?	1
Quick Specs	3
Powering ON	5
Charging Phiro	7
Phiro Key Guide	9
Phiro MODE Key	11
M1 Sequential Mode	13
M2 SWISH Card Mode	15
SWISH Card Color Guide	20
DIY Coding	25
SWISH Card Code List	27
M3 Bluetooth Mode	33
Phiro Lego® Accessory	35
Phiro Smartphone Mount	37
Phiro Shield Adapter	39
Troubleshooting Phiro	45

WHAT'S IN THE BOX?



WHAT'S IN THE BOX?

These are what you will find inside the box:

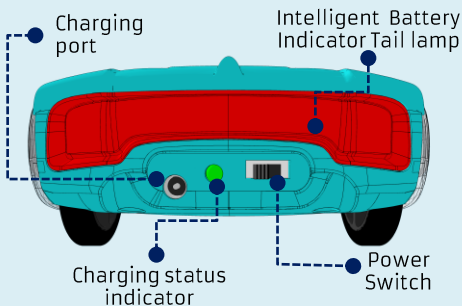
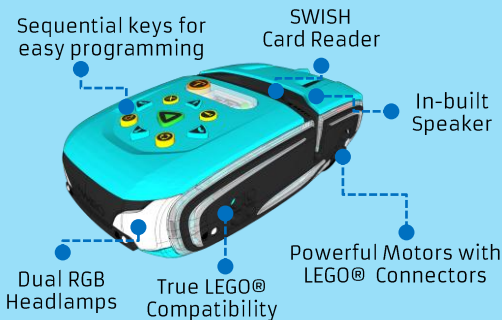
- A - Phiro Robot
- B - USB Charger¹
- C - Phiro LEGO® Accessory
- D - Phiro Swish Cards
- E - Accessory Clip
- F - Phiro Smartphone Mount*
- G - Phiro Shield + Phiro Shield Adapter
+/- Arduino UNO Board**

* Available to Phiro Pro buyers

** Available to Phiro Arduino Shield accessories buyers

1 - This charger is solely for the purpose of charging Phiro and cannot be used for transferring data.

Q U I C K S P E C S

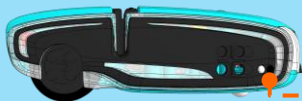


Q U I C K S P E C S

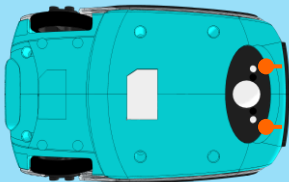


Phiro has
6 sensors

Front
Sensors
(Left and
Right)

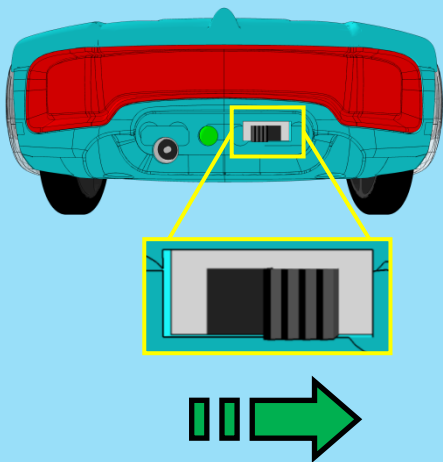


Side
Sensors
(Left and
Right)



Bottom
Sensors
(Left and
Right)

P O W E R I N G O N



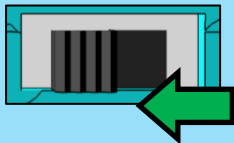
You can power ON Phiro by sliding the power switch to the right.

P O W E R I N G O N



Once powered ON, a **GREEN** Light will glow on the display panel.
Phiro is now automatically
in **Sequential Mode**.

CHARGING PHIRO



STEP 1

Power OFF Phiro.
Phiro WILL NOT
charge when it is ON.



To USB



To Phiro

STEP 2

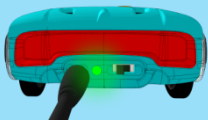
Connect the USB plug
to a USB port on a
laptop, desktop or
wall charger.



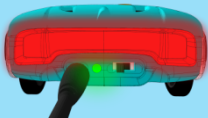
STEP 3

Connect the charger
pin to the Charging
port on the back of
Phiro.

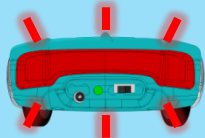
C H A R G I N G P H I R O



A **GREEN** light will glow when Phiro is charging.



When Phiro is fully charged, both the **RED** Tail lamp & the **GREEN** light will glow.



Phiro indicates **LOW** Battery condition by **blinking** it's Tail Lamp.



A full charge takes 4 hours

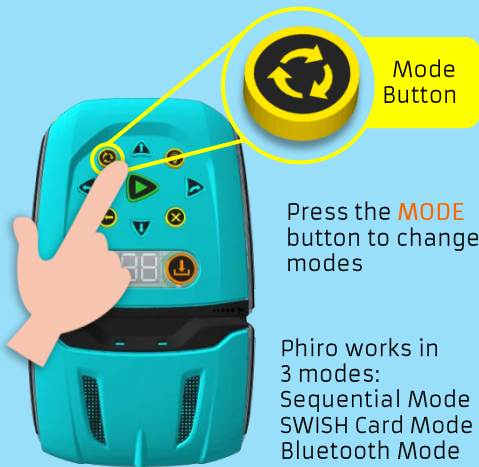
PHIRO KEY GUIDE



PHIRO KEY GUIDE

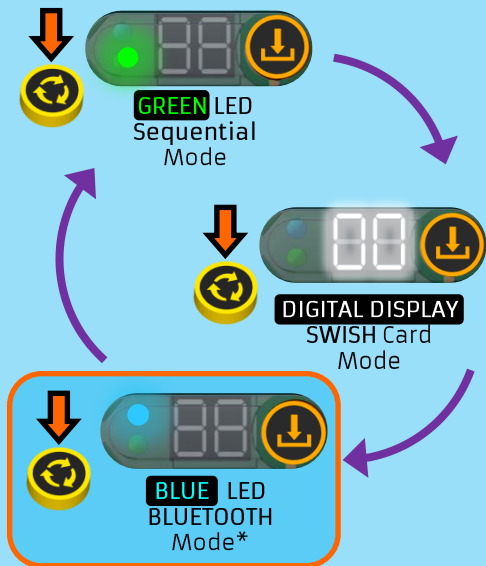
- 1 **LEFT** – Turn Phiro Left (Seq. Mode)
- 2 **MODE** – Cycle through 3 Phiro Modes
- 3 **FORWARD** – Move Phiro forward by 15cm approximately (Seq. Mode)
- 4 **LIGHT** – Set headlamps color (Seq. Mode)
- 5 **RIGHT**– Turn Phiro Right (Seq. Mode)
- 6 **PLAY/PAUSE** - Executes a program. Also functions as a **PAUSE** key when pressed during program execution. (Seq. & SWISH Card Modes)
- 7 **DEBUG** – Erase last command (Seq. & SWISH Card Modes)
- 8 **BACKWARD** – Move Phiro backward by 15cm approximately (Seq. Mode)
- 9 **DELETE** – Delete/Erase full program (Seq. & SWISH Card Modes)

PHIRO MODE KEY



Phiro will automatically be in "Sequential Mode" when powered ON

PHIRO MODE KEY



*Bluetooth Mode available only in Phiro PRO.

M1 SEQUENTIAL MODE



Press the buttons on the keypad and watch Phiro execute your program.

EXAMPLE PROGRAM

Let's make Phiro travel in the shape of the letter "S"



M1 SEQUENTIAL MODE



To make a NEW program, press the **CLEAR** button and then start programming

Press the following **DIRECTION** keys

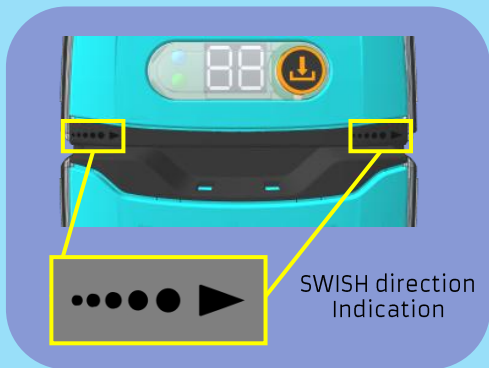


If you make a mistake, press the **DEBUG** button to erase the last command

Press the **PLAY** button to run the program

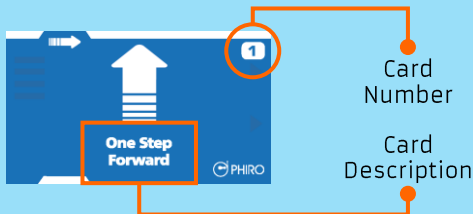


M2 SWISH CARD MODE



M2 SWISH CARD MODE

Description side



SWISH Code side



M2 SWISH CARD MODE

Press the **MODE** button until the digital display lights up



Code side should face the SWISH Card Reader

If the card is swiped correctly, Phiro will beep once



Phiro will display the card number for 2 seconds,

and then display the **total number of cards** that have been swiped so far.

M2 SWISH CARD MODE



Download
Button

Press the
DOWNLOAD
Button after
programming
with SWISH
Cards

Press the **PLAY**
button to run
the program



The **Debug** and **Clear**
keys will work in SWISH
Card Mode. (Ref. Pg 14)

M2 SWISH CARD MODE

If swished incorrectly, Phiro will beep twice.



TROUBLESHOOTING SWISH CARDS:

1. Make sure the card is swiped in the correct direction
(Ref. Pg 15)
2. Make sure the Code side of the card faces the card reader
(Ref. Pg 15)
3. Try and swish the card at a steady pace



Make sure Swiped card number and displayed card number are the same. If not, use **DEBUG** key to erase the previous command and swipe again.

SWISH CARD COLOR GUIDE



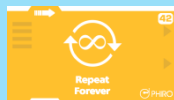
MOTION



MUSIC



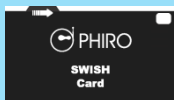
LIGHTS



CONTROL



PRE CODED



DIY CODE

SWISH CARD COLOR GUIDE



BLUE – 12
Movement Cards
Make PHIRO go Forward, Backward, Turn Right or Turn Left etc.



PINK – 8 Music Cards
Make PHIRO play Do, Re, Me, Fa, So, La, Ti. Once kids know the notes, they can create their own songs with these Swish cards.



PURPLE – 21 LED Cards
Independently control light color of right &/or left RGB LED. Make PHIRO display Red, Green, Blue, Cyan, Magenta, Yellow or Black (RGBCMYK).

Lost a SWISH card? Print your own cards!
Download the SWISH Cards files from our website www.robotixedu.com

SWISH CARD COLOR GUIDE



ORANGE – 26 Control cards

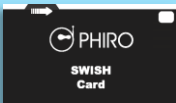
Program PHIRO to control the order in which PHIRO follows instructions. (e.g.) Repeat, Sensor Conditions, "IF statements" etc.



GREEN – 8

Pre-Coded cards

Just Swish the card & PHIRO will follow a light or avoid edges or follow a line or detect edges etc.



BLACK : 25

"DIY Code" Cards

Each of the 75 Swish cards has patterns of Binary Code represented as black & white bars. You can shade in the Code onto these blank Swish cards, to create different actions to control PHIRO.

SWISH CARD MODE

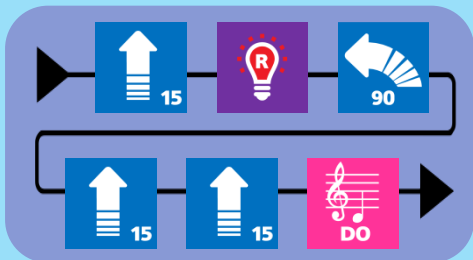
Programming EXAMPLE

OBJECTIVE

Let's make Phiro do the following actions:

- 1) Move Forward 15cm
- 2) Light up Right LED Red
- 3) Turn Left
- 4) Move Forward 30cm
- 5) Play "Do" tone

This is the flow of the program



SWISH CARD MODE

Programming EXAMPLE

Swipe cards in the same order:
1, 22, 3, 1, 1, 13

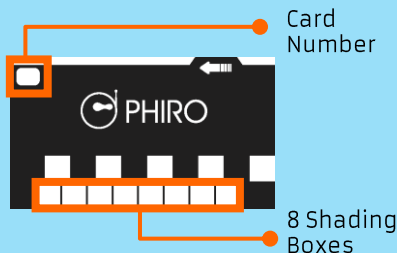


Press the **DOWNLOAD** button



Press the **PLAY** button





EXAMPLE

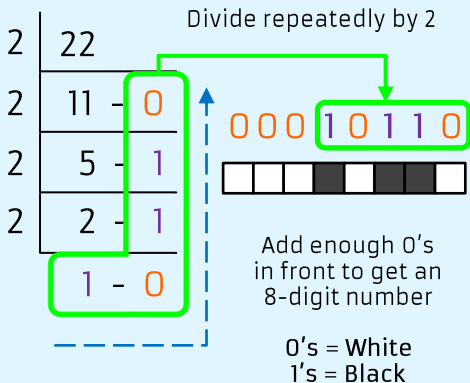
Suppose you want to make Phiro
light up its RIGHT LED - **RED**

We will need Card Number 22
for this action



Ref. Pg.27 for SWISH Card
numbers and Codes

DIY CODING



Shade the pattern with a **Black Marker**

Swipe the card as usual to make Phiro flash its LEDs **RED**



SWISH CARD CODE LIST

No	Card Function	Code
1	One Step Forward	0000 0001
2	One Step Backward	0000 0010
3	Turn Left	0000 0011
4	Turn Right	0000 0100
5	Left Motor Forward	0000 0101
6	Left Motor Backward	0000 0110
7	Right Motor Forward	0000 0111
8	Right Motor Backward	0000 1000
9	Forward Continuous	0000 1001
10	Backward Continuous	0000 1010
11	Turn Left Continuous	0000 1011
12	Turn Right Continuous	0000 1100
13	"Do" Music Tone	0000 1101
14	"Re" Music Tone	0000 1110

SWISH CARD CODE LIST

No	Card Function	Code
15	"Mi" Music Tone	0000 1111
16	"Fa" Music Tone	0001 0000
17	"So" Music Tone	0001 0001
18	"La" Music Tone	0001 0010
19	"Ti" Music Tone	0001 0011
20	Sound Break	0001 0100
21	Left LED Red	0001 0101
22	Right LED Red	0001 0110
23	Both LEDs Red	0001 0111
24	Left LED Green	0001 1000
25	Right LED Green	0001 1001
26	Both LEDs Green	0001 1010
27	Left LED Blue	0001 1011
28	Right LED Blue	0001 1100

SWISH CARD CODE LIST

No	Card Function	Code
29	Both LEDs Blue	0001 1101
30	Left LED Cyan	0001 1110
31	Right LED Cyan	0001 1111
32	Both LEDs Cyan	0010 0000
33	Left LED Magenta	0010 0001
34	Right LED Magenta	0010 0010
35	Both LEDs Magenta	0010 0011
36	Left LED Yellow	0010 0100
37	Right LED Yellow	0010 0101
38	Both LEDs Yellow	0010 0110
39	Left LED White	0010 0111
40	Right LED White	0010 1000
41	Both LEDs White	0010 1001
42	Repeat Forever	0010 1010

SWISH CARD CODE LIST

No	Card Function	Code
43	Repeat Once	0010 1011
44	Repeat Twice	0010 1100
45	Repeat Five Times	0010 1101
46	Repeat Ten Times	0010 1110
47	Operation Time 0.5 sec	0010 1111
48	Operation Time 1 sec	0011 0000
49	Wait 1 second	0011 0001
50	Stop!	0011 0010
51	IF FL Sensor	0011 0011
52	IF FR Sensor	0011 0100
53	IF BL Sensor	0011 0101
54	IF BR Sensor	0011 0110
55	IF SL Sensor	0011 0111
56	IF SR Sensor	0011 1000

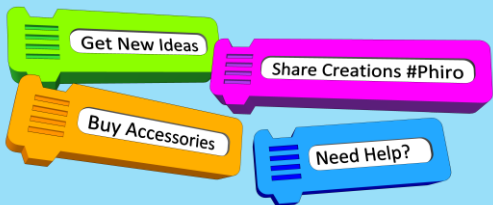
SWISH CARD CODE LIST

No	Card Function	Code
57	IF FL AND FR Sensors	0011 1001
58	IF FL AND SL Sensors	0011 1010
59	IF FR AND SR Sensors	0011 1011
60	IF SL AND SR Sensors	0011 1100
61	IF BL AND BR Sensors	0011 1101
62	IF FL OR FR Sensors	0011 1110
63	IF FL OR SL Sensors	0011 1111
64	IF FR OR SR Sensors	0100 0000
65	IF SL OR SR Sensors	0100 0001
66	IF BL OR BR Sensors	0100 0010
67	Else Statement	0100 0011
68	Line Follower	0100 0100
69	Light Follower	0100 0101
70	Edge Detection	0100 0110

SWISH CARD CODE LIST

No	Card Function	Code
71	Obstacle Avoider	0100 0111
72	Obstacle Follower	0100 1000
73	DEMO Music 1	0100 1001
74	DEMO Music 2	0100 1010
75	Rainbow Light Mode	0100 1011

DIY CODE cards – 25 cards



www.robotixedu.com



M3 BLUETOOTH MODE *

The following software can be used to program and control Phiro wirelessly!



POCKETCODE

Available for Android
on Google Play.
Scan the QR Code to
download the app on
your smartphone.



Snap4Arduino

Available for
Windows, Mac
and Linux

SCRATCH

Available for
Windows and
Mac

Visit
www.robotixedu.com
to download the software bundles
and FREE lesson plans

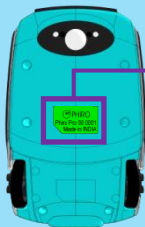
M3 BLUETOOTH MODE *

Press the **Mode** button until the **BLUE** LED lights up



BLUE LED
BLUETOOTH
Mode

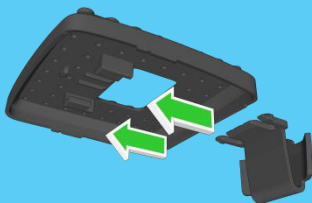
PAIR Phiro and your laptop,
PC or mobile device before
programming via Bluetooth



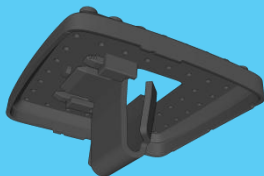
Phiro ID on the sticker
on the bottom plate

* Available for Phiro PRO only

1/4



2/4





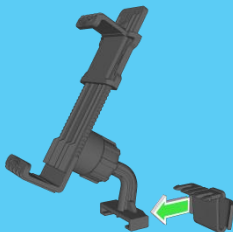
3/4



4/4

PHIRO SMARTPHONE MOUNT

1/3



2/3



Accessory for Phiro Pro only

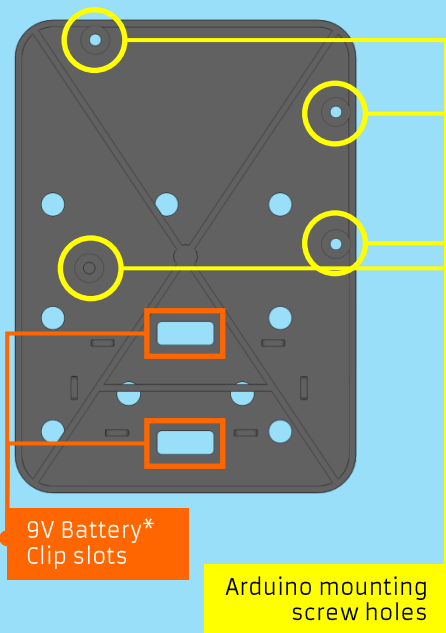
PHIRO SMARTPHONE MOUNT



3/3

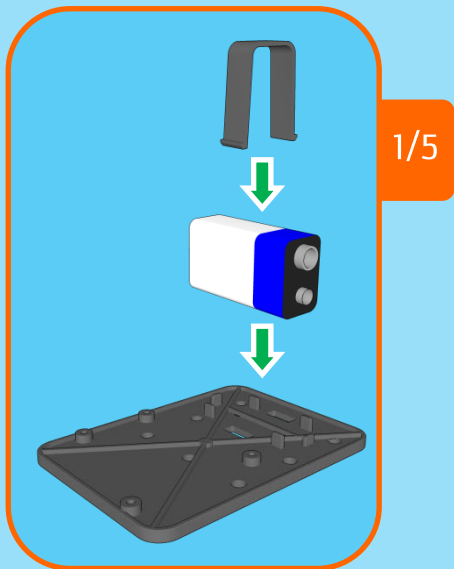
PHIRO SHIELD ADAPTER

Optional Accessory for Phiro Pro only



*Battery not included in package

PHIRO SHIELD ADAPTER



For more information about using the Phiro Arduino Shield, please visit our website www.robotixedu.com

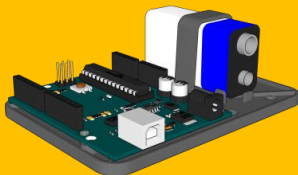
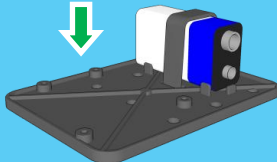
PHIRO SHIELD ADAPTER

2/5

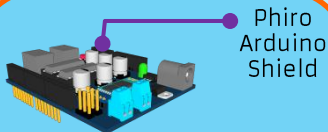
Arduino
UNO Board



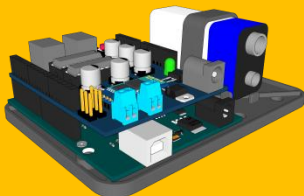
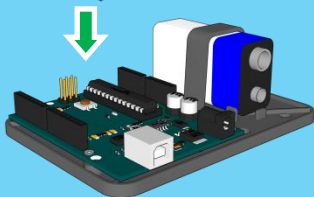
X 4



PHIRO SHIELD ADAPTER



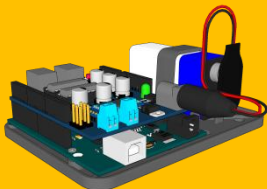
3/5



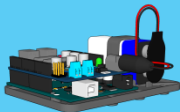
PHIRO SHIELD ADAPTER

4/5

Connect
battery to
Phiro Shield



PHIRO SHIELD ADAPTER



5/5



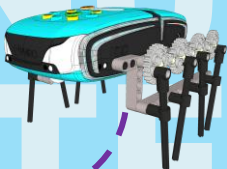
TROUBLESHOOTING PHIRO

Problem	Solution
Phiro won't do anything	Turn on Phiro by switching on by power button Make sure Phiro is charged. You can charge Phiro as per given instruction <i>(Ref. Pg. 7)</i>
Phiro arrow keys are not working	Phiro keys will work only in Mode1 (Sequential Mode)
Phiro display showed wrong number	Press DEBUG button once and Swipe card slowly

TROUBLESHOOTING PHIRO

Problem	Solution
Swish card doesn't read card (Beep Twice)	Make sure card is swiped in correct direction as given in the instruction (<i>Ref. Pg.15</i>)
Phiro doesn't travel straight	Look for foreign objects on wheels Make sure the surface is even
Phiro Pro robot disconnects communication with Windows PC or Android Smartphone or Android Tablet	Restart Phiro & software.

For support email us at
robotixusa@robotixedu.com





Ferris Wheel



Automated Board Game

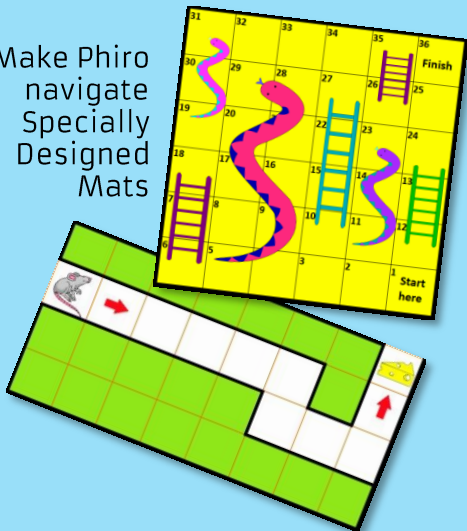


Gesture Control

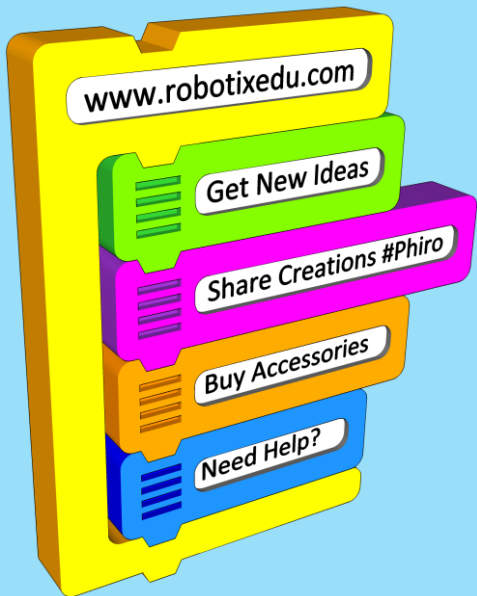
For more ideas,
check out our
videos on

YouTube

Make Phiro
navigate
Specially
Designed
Mats



Available on
www.robotixedu.com



ATTRIBUTIONS: LEGO, Apple, Google Play, Android, Windows, Arduino, Scratch, Snap4Arduino, Pocket Code logos are all trademarks/service-marks of their respective companies, organizations or owners.

PLAY
CODE
INNOVATE

For support email us at
robotixusa@robotixedu.com



Made in India



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U.S.A