

Product Information Guide

This user guide contains, safety, handling, disposal, recycling and regulatory information as well as the limited warranty for the Kai's Clan Product.

Read all safety information and operating instructions before using Kai's Clan, to avoid injury, harm or damage to property.

Disclaimer

All information and instructions in this document are subject to change without notice. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or other property. This Manual contains instructions for safety and operation. It is essential to read the entire Manual and follow all instructions and warnings in the manual, prior to setup or use, in order to operate the Kai's Clan correctly and avoid damage or injury. Autonomous Works Limited has made every effort to provide clear and accurate information in this Manual, which is provided solely for the user's information. While thought to be accurate, the information in this document is provided strictly "as is" and Autonomous Works Limited will not be held responsible for issues arising from typographical errors or user's interpretation of the language used herein that is different from that intended by Autonomous Works Limited. All safety and general information is subject to change as a result of changes in applicable laws. Autonomous Works Limited reserves the right to revise this Manual and make changes from time to time in the content hereof without obligation to notify any person of such revisions or changes. In no event shall Autonomous Works Limited, its employees or authorized agents be liable to you for any damages or losses, direct or indirect, arising from the misuse of any technical or operational information contained in this document.






















kai's <clan>

User Guide





	Welcome	5
	Overview	5
	What you'll need	6
	5 Top Tips for Teaching Kai's Clan in Classroom	6
	Smartphone Setup (One-time setup)	9
	Register your Teacher Account	10
	Create Classroom	10
	Robot Setup (One-time setup)	11
	Pairing Robots	13
	Robot States	15
	Student log in	16
	Allocate Robots to Students	17
	AR VR Adventure Mats	18
	Kai's Clan Virtual Viewer User Guide	18
	Adding Internet of Things (IoT) sensor bits	18
	Charging your Kai Robots	20
	Update your Kai Robot Firmware	21
	Kai IoT Bit Board	21
	Kai's Cloud User Interface	23
	Kai's Eye Robot Tracker app	24
	Combing 2 mats / classrooms together	25



Classroom variables aka global variables.....26



Troubleshooting.....28



Welcome ...

Kai's Clan is a toolbox that can teach coding, robotics, Augmented Reality (AR), Virtual Reality (VR) and Internet of Things (IoT) in one-easy-to-use web platform that works seamlessly on just about any device.

This user guide will help you get the most out of Kai's Clan.

Let's get you started with a big High Kai Five.



Overview

A compatible smartphone on top of a tripod running the “Kai's Eye Robot Tracker” app, keeps track of the robots moving about the mat.

The Kai robots connect to the Kai's Cloud via the smartphone's Bluetooth & internet connection.

Students can use Chrome books, iPads or computers with Safari or Chrome browser to code in the Kai's Cloud Platform. It's like a multi-player game or team sport where students code and work together.



a

The physical mat & robots merge together with a matching virtual environment. Move your robot on the mat and see your robot avatar move in the virtual world.

Various sensors can be connected to your Kai robots and the data gathered can be shared in real-time between schools or across the world.



What you'll need

1. Kai's Clan Start or Classroom Pack
2. You will need an Android, iPhone or preferably an iPod touch that supports video at HD 720p or greater. This phone is mounted on the included phone tripod and placed overlooking the included mat. Once the phone is setup, you don't need to access it often. No SIM card is required for the phone, just Wi-Fi, Bluetooth and the phones camera are used. *Note: It is not recommended to use an iPad as they do not fit the included phone tripod and are too heavy.*
3. A good Wi-Fi Internet Connection for the phone or iPod.
4. USB 2 amp charging port to charge the robots with the included 4-to-1 cable.
5. Student classroom computers, iPads, Chromebooks or any device with the latest version of Chrome or Safari browser on to access <https://app.kaisclan.ai>



5 Top Tips for Teaching Kai's Clan in Classroom

Tip 1: Allow free time to play

Students are most engaged when they choose activities and have ownership of their learning process. Allow your students free time to try out the various functions of the Kai.

Start with the Kai robots on the student's desks next to them, where they can get familiar with the Kai Robots. We suggest using the mat later on, once students have become familiar with the Kai robots.

Your Kai Blockly has special blocks that use a drop down to select the robot you want to control or read data from. The teacher allocates robots to individual students.



Tip 2: Start with driving around

The easiest way to get to get started is to learn how to drive, rotate and use the grippers. There are two types of movement:



Free movement allows you drive “off road / off mat” without using Kai’s Eye to keep track of your robot’s position on the mat. This is a handy way for students to start getting an understanding of movement.



Mat movement use coordinates. If students are not familiar with coordinates, using Kai’s Clan is a great way to introduce them. Robots are placed on the mat and the Kai’s Eye app on the phone, keeps track of their positions. This way students can use coordinates to move their robot to a precise x, y position. Each mat has a rule printed around the mat. **Red is for x** and **Blue is for y**.

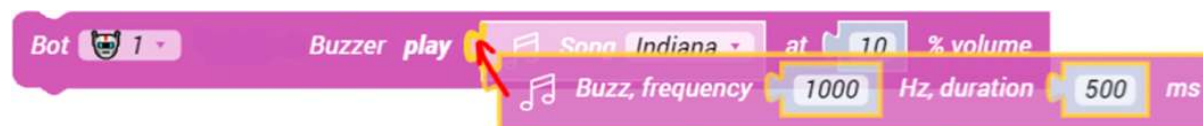


The coordinates of the mat & map are 80cm x 80cm (31 ½” x 31 ½”)

Tip 3: Play with music, lights and the distance sensor

The beauty of Kai’s Clan is that everything happens live in real-time, not matter if your in the classroom next door or at a school on the other side of the world.

Sound: There are several ways to make your Kai robots to play sound. You can select a built-in song or create your own.



Lights: You can use various code blocks to change the colours of the front eyes of your Kai robot.



Distance sensor: The front eyes of the Kai robot house a ultrasonic distance sensor that uses sound waves to measure the distance from an object in front of it. The larger the object the more accurate the measurement.

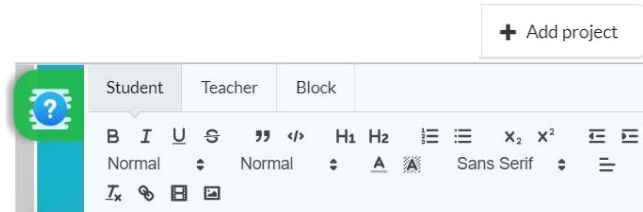
This example, uses an IF stament to determin if there is a object in front of the Kai Robot



and if there is move forward.

Tip 4: Projects / Lessons

There are many projects to choose from. With your teacher account you can also create your own lesson plans and document, embed videos and share with the Kai's Clan community.



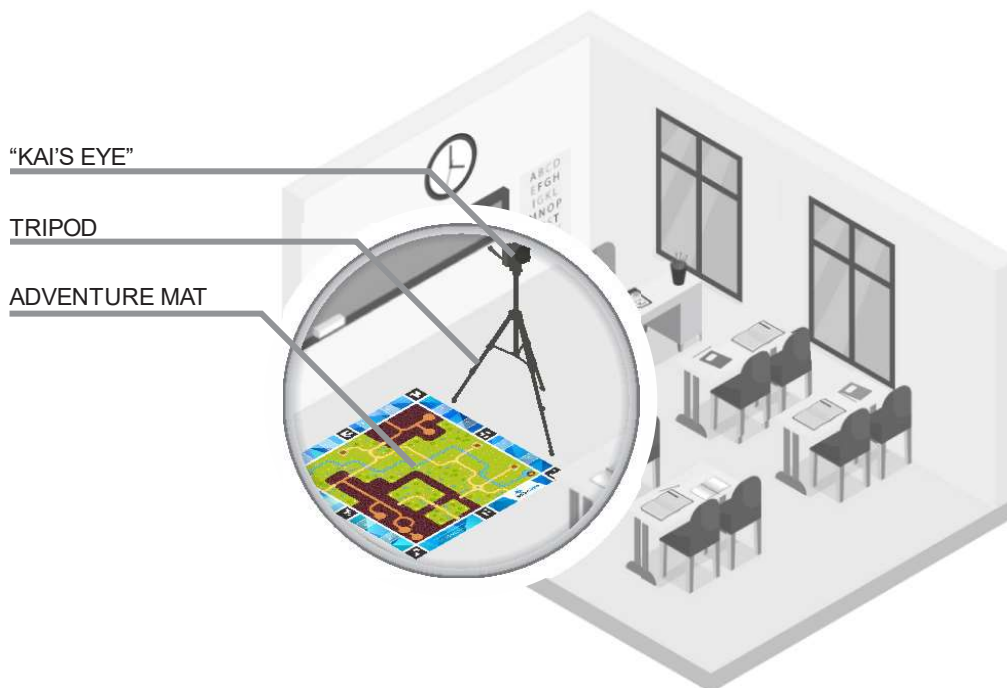
Tip 5: Collaboration

The biggest benefit with Kai's Clan is to be able to share your Classroom code with others, no matter where they are in the world.

AR / VR: Simply share your classroom QR code and links to the [Android](#) or [iOS](#) Kai's Virtual Viewer app, then your friends can watch your students code come to life in AR or VR.

Collaborate: If you would like others to join in and code your Kai robots remotely, just create a student account and assign a robot for your guest. Setup a video call with your guest so they can see the robot moving around on your mat.

Two classrooms work together: This setup requires two classrooms and each classroom uses the same classroom code and the same mats. Robots from both separate classrooms are displayed on everyone's Kai's Cloud maps. A great example of Kai Classroom Collaboration!





Smartphone Setup (One-time setup)

1. Using either an Android or iPhone, connect the phone to the internet and check that you have a working internet connection. If your school uses a proxy, ask the schools IT department for the proxy settings and connect to the internet. **Note: You only need one phone or iPod touch per tripod and mat and the phone does not require a SIM card.**
2. Visit the [App Store](#) or [Android Play Store](#) and search, download and install “Kai’s Eye Robot Tracker” and start the “Kai’s Eye” app.

3. In Kai’s Eye app, select “QR scan” and then scan the **serial number** barcode printed outside of the Kai’s Clan box or on the cover of the Quick Start Guide included in your pack.

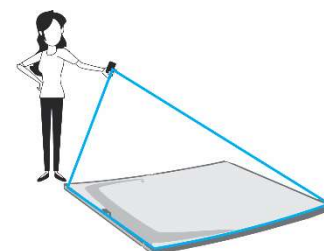


4. Roll out the Kai’s Clan Adventure Mat on the floor, ensuring you have space to around the mat.



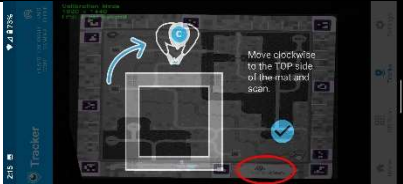

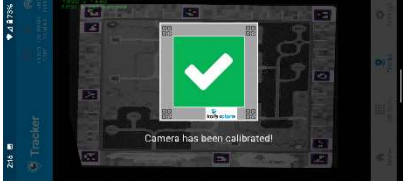
walk

5. Ensure the mat is clear and nothing is placed onto it. Ensure there is no direct sunlight shining on the mat.



6. ‘One time’ phone camera calibration. In the Kai’s Eye app Select “Tracking” and this will start the camera calibration (if the phone’s camera has never been calibrated)

a.) Look for the “Kai’s Clan” logo on the mat and stand in front of it and align the video of the camera to the entire mat. Follow on-screen instructions.		
b.) Move yourself clockwise, to the left side of the mat and align the entire camera view of the mat again.		

c.) Move clockwise, to the top side and align the entire camera view of the mat again.		
d.) Move clockwise, to the right side and align the entire camera view of the mat again.		
Once the right side completes, you should get a successful notification. If it failed, start again from a. and try again. Note: This just needs to be done once.		

💡 Place your phone/ tablet in landscape mode whilst in tracking mode

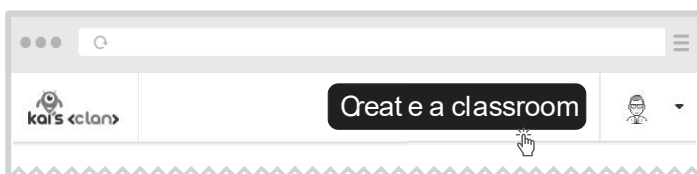


Register your Teacher Account

1. On your teacher computer open <https://app.kaisclan.ai>
2. Register a new Kai's Clan Teacher account
3. If you don't receive your activation email, check your SPAM folder or contact support@kaisclan.ai
4. Once you have logged in, create a classroom.



Create Classroom



1. On your teacher computer open <https://app.kaisclan.ai>
2. Log in with your teacher account that you created earlier.

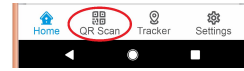
3. Click “Create a new classroom”

Create a new classroom



4. Give your classroom a name.

5. Use the phone, open the **Kai's Eye** app and select **QR Scan**



6. Scan the QR Classroom code.



7. In the Kai's Eye app you'll see your classroom code in the app.

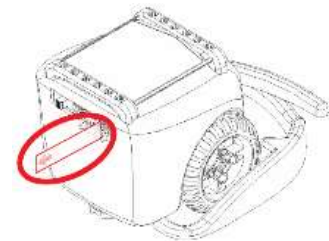
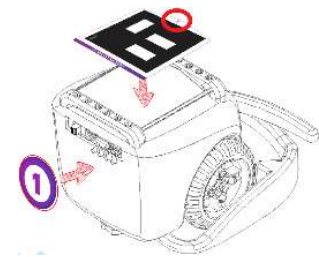


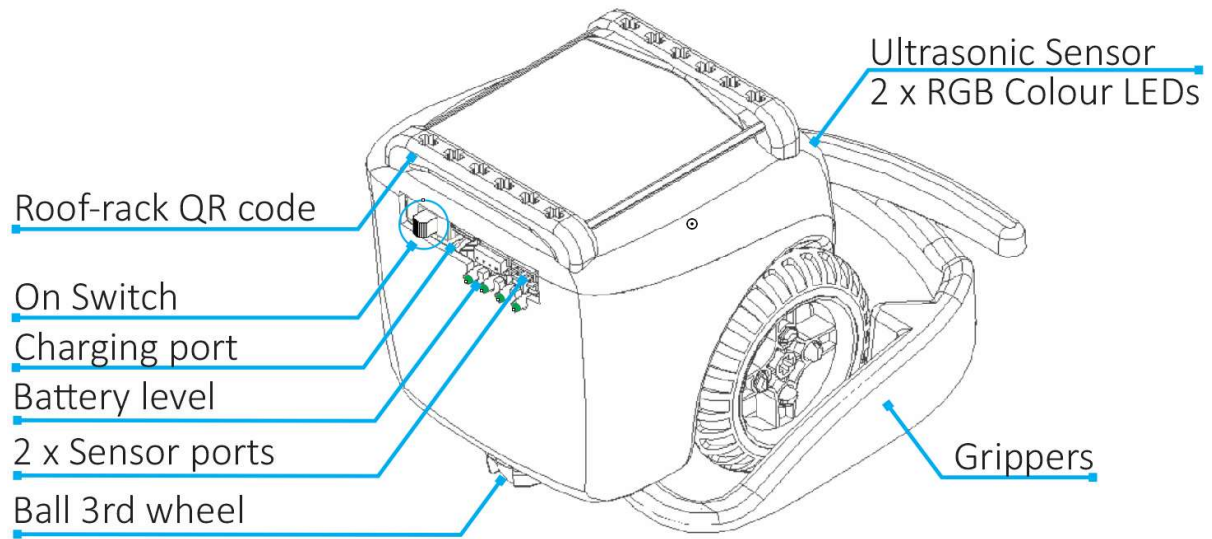
8. Refer to “Adding Students to your Classroom” section.



Robot Setup (One-time setup)

1. Included in your pack are sheets of numbered QR codes and associated number stickers.
2. Attach a numbered QR code sticker to the roof rack of the robot.
3. Find the matching circular number sticker (this must match the QR code number) and attach to the back of the robot.
4. Remove the battery protection sleeve from the back of the robot.
5. Switch on the robot, the Kai robot mask LED lights should start flashing white and the grippers will open.

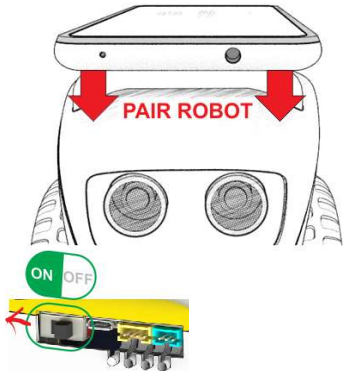
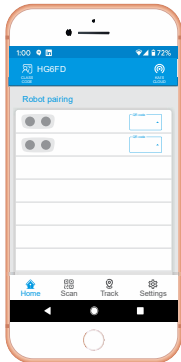
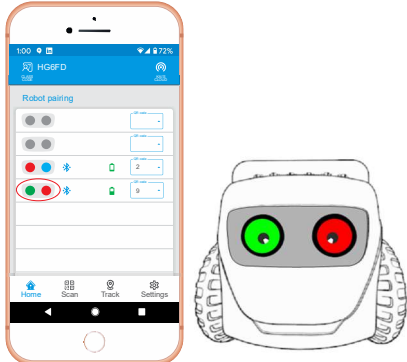


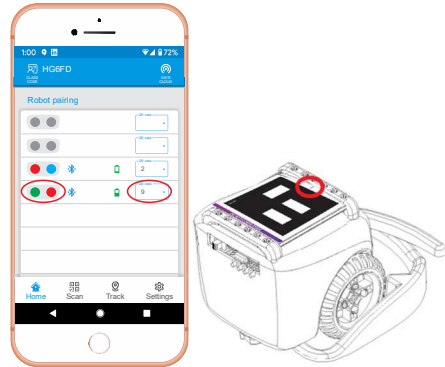




Pairing Robots

All Kai robots use Bluetooth to pair with the phone.

Open the “Kai’s Eye” app on the phone.	
Switch on one robot and bring it up to the phone for the pairing to start. Phone and robot should be touching!	
On the Kai’s Eye app, you will see a grey Kai mask icon appears and after a few seconds the mask colour will change to a colour mask.	
On the Kai’s Eye app, match the robots left & right eye colours to the left and right colours shown in the app.	

<p>On the robot, read the unique QR code number on top of the robot and enter that number into the Kai's Eye app next to the matching colour mask.</p> <p>The robot grippers will close and the robot is now paired.</p>	
<p>Repeat the above pairing process for each robot.</p>	
<p>Once you finished pairing all robots, mount the phone into the tripod and select “Robot Tracker”</p>	

Pairing Robots Tips”

When pairing robots you probably want to follow the below...

It is recommended, to dedicate a phone (without a SIM card) to the Kai's Clan kit, so once the robots are paired the first time, they will automatically pair when you start the Kai's Eye app the next time. We don't recommend using your personal phone, messages, calls etc will interfere with the running of the robots & classroom.

Delete all the previous robots that are listed in the Kai's Eye app.

1. Close all Kai's Eye apps that might be running on other phones! This could interfere with robots pairing.
2. Open the Kai's Eye app, switch on just one robot and pair that robot inside the Kai's Eye robot. (hold the Kai's Clan robot close to the phone)
3. Leave the first robot switched on, Switch on the second robot and pair.
4. Select the matching robot ID, and the grippers should close.

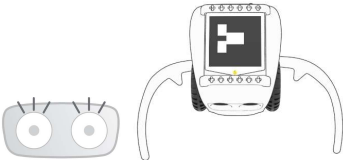
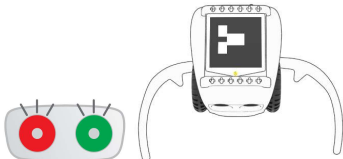
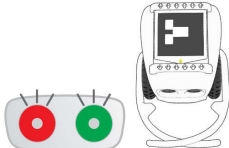

The classroom code does not have much to do with the robots and changing classroom codes does not affect. You can always just refresh your browser, if you finding robots are not coming up.

Note: The first two robots paired to the Kai's Eye app, communicate via Bluetooth, called "router robots" . Robots 3 onwards, connect to the first two "router" robots. If one of the first two robots, batteries go flat or get switched off, can cause robots 3 onwards to vote and elect a new "router" robot.






Robot States

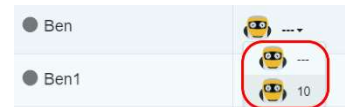
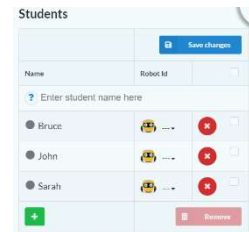
When you switch on a Kai robot it has different states, let's go over each of them.

	Not paired with phone. Robot grippers open & front eyes flash "white"
	Pairing not completed. Robot grippers open & front eyes flashing random two colours. Note: Each robots eye colours will flash different colours.
	Successfully paired! Robot grippers closed & front eyes flashing two colours. Note: Each robots eye colours will flash different colours.
	During charging, both lights flash green. When fully charged, lights blink purple and the robot beeps to indicate fully charged.



Add Students to your classroom

1. On your teacher computer open <https://app.kaisclan.ai>
2. Log on with your teacher account **TEACHER** or **STUDENT** and select your classroom.
3. On the right hand menu tab select the students icon 
4. There are two ways to add students, one at a time or by copying and pasting a list from Google Sheets or Excel.
 - a.  Click the green + icon, this adds a new random student username after each click. Feel free to rename student names.
 - b. Or you can use a list of students from Excel or Google Sheets. Copy only the students first names and then paste into this area. If you have two students with the same first name, just edit and add an initial of their surname.
5. If you have already paired your robots, then you can allocate robots to students. Just select a robot ID (*This is the Robot QR code ID printed on top of the robot roof rack*).
6. Click Save Changes 
7. If you wish, you can print Student Login Cards for them to easily gain easy access to Kai's Clan Cloud.



DON'T: Share students' faces or names without explicit, parental consent. Unless you've made some arrangement with parents and students, always make sure that students' faces and names are obscured. Rather use unidentifiable usernames. We suggest the use of usernames for students to protect their privacy. <https://kaisclan.ai/kais-clan-privacy-policy/>



Student log in

There are two ways for students to log into your Kai's Clan classroom.

A Login by scanning the Student Login QR Code

1. Using the printed student login cards.
2. Get the students to open either a Safari browser or Chrome browser their iPad, computer or Chromebook.
3. Open <https://app.kaisclan.ai> and select **STUDENT** login.



on

I'm a **TEACHER** or **STUDENT**

- If the student device has a camera then click on “**QR Code Login**”. Your browser should pop up a message asking for permission to allow to activate camera. If this doesn’t work, then use method **B**.



the



Note: On the iPad we recommend using Safari.

B Login with Student username and classroom code, as per the names the teacher created.

- Get the students to open either a Safari browser or Chrome browser on their iPad, computer or Chromebook.
- Open <https://app.kaisclan.ai> and select **STUDENT** login.
- Enter their student username and enter the classroom code.
- If the student does not have a robot allocated to him, use your teacher account under students to allocate a robot to that student.

I'm a TEACHER or STUDENT



Any student login problems refer to the section **Adding students to your classroom**.




Allocate Robots to Students

Before you can allocate any robots to students:

- Robots must be paired. Refer to the pairing section in this user guide.
- If you have successfully paired robots, then robot grippers will be closed and different coloured LED eyes and you will also see a blue online robot icon appear on the map view.



flashing

- Log in with your teacher account at <https://app.kaisclan.ai>
- Once logged in, select the Students tab.
- If you don’t have any students loaded, refer to **Add Students to your classroom** in this user guide.
- Choose the student from the list and click the Kai Robot icon  6 and select the matching robot ID and click Save changes.
- Ask that student to refresh their browser if no robot listed under their move block.



Note: Just like a car, you only have one driver at a time. Allocating a robot to a specific student, allows only that student to drive & control that robot. Students that don’t have drive/move access to robots, can still access other students robots position information, sensor data and use that data in their code.

Example: A spaceship travelling to Mars has 1 astronaut pilot and has hundreds of people on the ground in mission control.



AR VR Adventure Mats

There are several mats to choose from and when the Kai's Robot tracker app on its tripod sees one of these mats and a robot on a mat, two things happen.



1. The mat is displayed in <https://app.kaisclan.ai> 2D mat view
2. The matching mats themes are unlocked in the Kai's Virtual Viewer 3D display.

Kai's Clan Virtual Viewer User Guide

Here is a detailed user guide to using the Kai's Virtual Viewer App.

<https://docs.google.com/document/d/1vSecyupi3IHmOli0oI7HTOmnaVpintqfWcHDp8IL1MM/>




Adding Internet of Things (IoT) sensor bits

The Internet of Things (IoT), is a technological paradigm that is conquering the entire world by connecting various objects around us to the internet. From cars, dishwashers, bee hives, curtains etc.

It's easy to add a sensor bit to your robot to allow it to either:

- Collect data from the sensor bit and use that data in your code. **Example:** If the humidity of robot 4 goes above 80%, then play a sound.
- Trigger events that run code when something happens. **Example:** If the button on robot 4 is pushed, then play a sound.

1. Choose a sensor from the included sensor bit pack to add to your robot.
2. Make a note of the colour of the sensor bit printed on top of the sensor bit pack label.
(green or yellow)

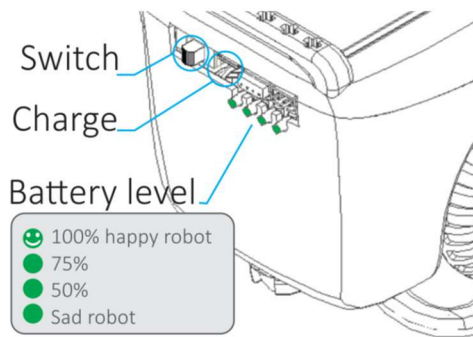
- a. If the picture of the sensor bit is **green**, then use a cable with a **green** plug.
 - b. If the picture of the sensor bit is **yellow**, then use a cable with a **yellow** plug.
3. Connect the cable with the white plug into the sensor bit and the **green** or **yellow** plug into the back of the robot.
4. In the included parts box, find a roof rack clip and slide the sensor into the clip and then connect the clip into the robot roof rack. **Note:** *Don't cover the QR code on the roof!*
5. In Kai's Cloud, (<https://app.kaisclan.ai>) click on the robot tab  and select the robot that you connected the sensor bit to.
6. Now click either the **green** or **yellow** circle.
7. Then find the sensor from the list and click save. You will hear your robot beep.
8. Check the sensor bit is working under the Robot sensor graph section, under the map view.
Refer to **User Interface** section **S**.



Clicking this icon will export all sensor data that has been collected since you logged on. Once you log off or close your browser all sensor data is lost.



Charging your Kai Robots



1. Use the USB 4 to 1 charging cable that is included in your pack.
2. Connect the Micro USB end to each one of your robots, up to 4.
3. Connect the USB Type A end into a powered USB port. A 2A USB charger is recommended.
4. With a 2A USB charger it takes around 1 hour to get +/- 80-90% charge with 4 robots connected.

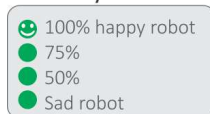
Note: A full charge will last around four hours when idle.

During Charging

Both front LED eyes pulse light green

The back-battery level LED pulse green depending on the level of battery.

Battery level



Fully Charged

Once the robot is fully charged, both front LED eyes blink bright purple and the back battery level will display 4 green LEDs. Also the Robot will beep every few seconds telling you that the battery is fully charged.



Note: Robots cannot be paired during charging.

↑ Update your Kai Robot Firmware



Note: ↑ Red arrow indicating new firmware available for this robot.

In your Kai's Eye app, if you any robots have a red arrow ↑ icon next to them, then it is recommended to update the firmware on these robots.

1. Pickup one robot that needs a firmware update.
2. Switch the robot off.
3. Using a sensor bit cable with a **green** plug. Connect the green plug into the **green** socket at the back of the robot.
4. Plug the other end with the **white** plug into the **yellow** socket, creating a loop.
5. Switch on the robot and the robot should be flashing purple.
6. On the phone, tap settings, tap Network & Internet, tap Wi-Fi.
7. In the list of Wi-Fi networks search for a network name starting with "KAI.." and connect to it.
8. Open the Kai's Eye app, tap Settings, tap Firmware update icon

Wait a few seconds and the robot will beep if the update was successful.

9. Unplug the **green** and white plug wire from the robot.
10. Switch off and switch back on the robot and then pair again.

Kai IoT Bit Board

With Kai's Clan you don't have to be stuck coding little yellow robots around a mat. There is so much more that you can do with it. Each robot has a powerful 32bit CPU Xtensa dual-core 32-bit LX6 microprocessor, operating at 160 or 240 MHz and performing at up to 600 DMIPS.

Become a Kai road warrior!

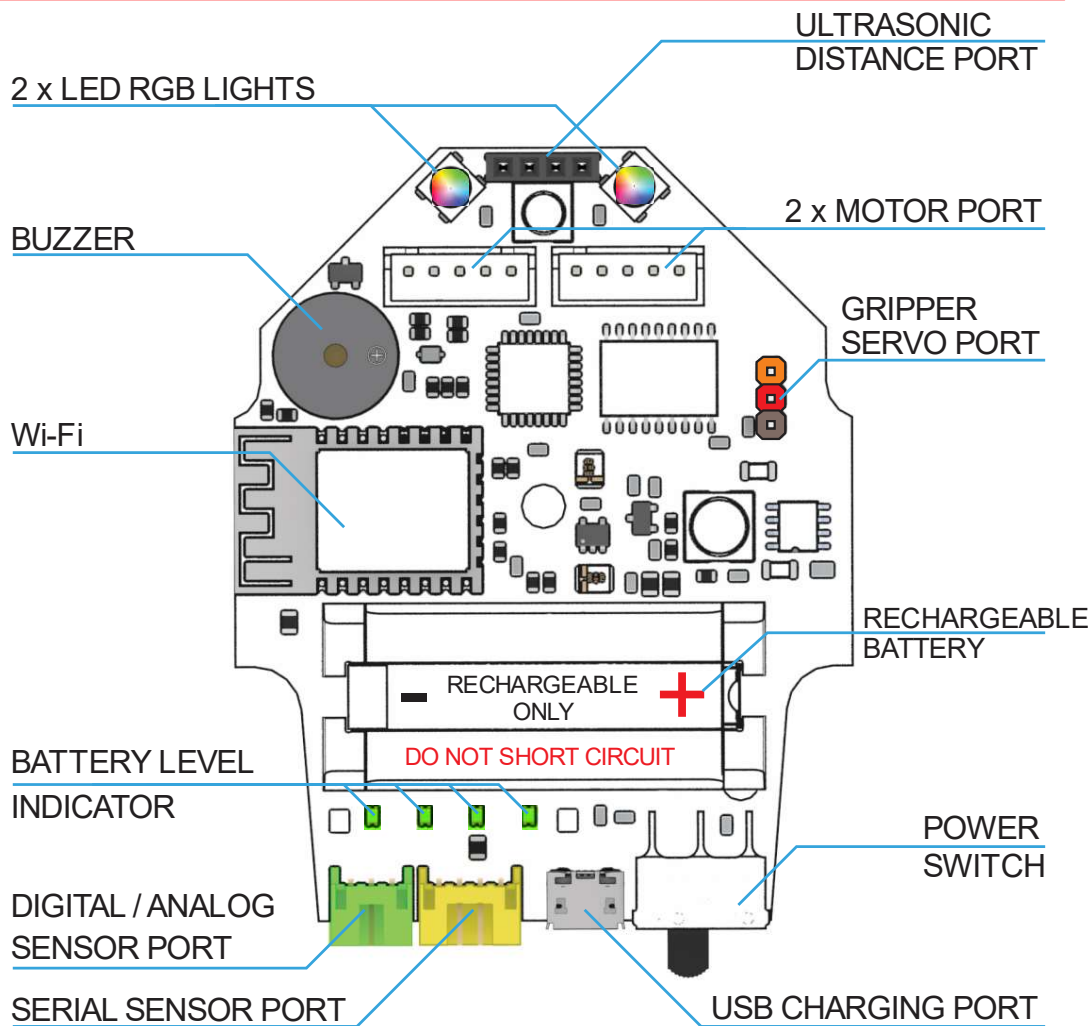
It's easy to have Kai send data back to your Kai's Cloud account, no matter where you are in the world.

Simply....

1. Use your smartphone with a mobile data or any internet connection.
2. Install the Kai's Eye Robot Tracker app.
3. Pair the robot like you would normally do via Bluetooth.
4. Connect a sensor to the robot.
5. Before you leave, keep your computer logged on to your Kai's Cloud account. This will capture all your sensor data while you are out and about.

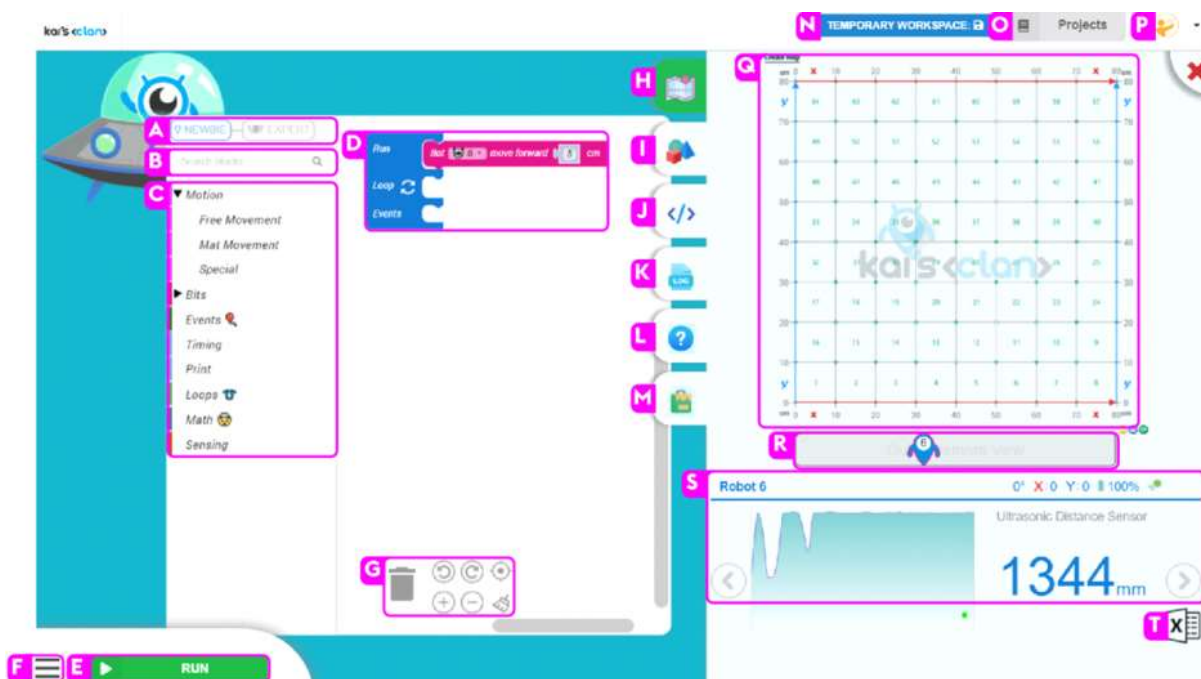
6. Travel around with your phone and Kai. Example: Go down to the local river and do water quality testing.
7. Approximately once per second, your Kai robot will send the data back to your Kai's Cloud account via your phone internet connection.

Note: Kai's Clan is an online real-time cloud platform and does not work offline.










Kai's Cloud User Interface



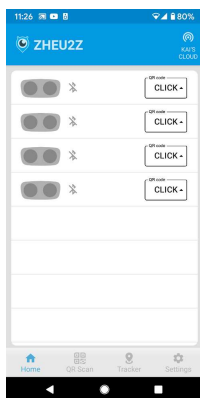
- A. Select either **Newbie** or **Expert** coding blocks.
- B. Type in to search for coding blocks. Note: Search results are blocks listed under Newbie or Expert.
- C. Various coding blocks. For Help, right clicking on any coding block and select help.
- D. The blue Run, Loop & Events block is always present and cannot be removed. 1.RUN is run once. 2. LOOP is loop the code forever. 3. Events – are activated by an action
- E. RUN – this runs the code you have in either Run, Loop or Events. Click STOP to stop running the code.
- F. Menu – Show the classroom QR code, number of students and if the phone camera Kai's Eye needs to be aligned to view the mat.
- G. **Bin**: drop code blocks to delete. **Undo**, **Redo**, **Align** code blocks to centre of screen. **+** zoom in, **-** zoom out, **brush**: delete all unused code blocks.
- H. **Map view**: Displays the robots on the map. The map changes depending of what mat you have on the floor. Map uses coordinates **x** & **y**. Students can move their robots to a precise position on the mat / map. Mouse over the mat to see the **x** & **y** position. Click on a robot to see it's **x** & **y** position in section S.
- I. **3D viewer**: If you are using an AR VR Adventure mat, then you can view your robots view inside a 3D environment in your browser. This page also contains links to Kai's Virtual Viewer for Android or iOS. Note: You have to code your physical robot to move on the mat, to see your virtual character also move. Also see coding blocks under **Expert \ 3D Effects**.
- J. **Code view**: This view shows what you have coded but in JavaScript. Python coming soon.
- K. **Log view**: Use the **Print** code blocks to help debug your code or to see errors.
- L. **Help view**: The help has two sections, Teacher and Student. If you are logged on as a Teacher you see both, if logged in as a Student you just see the student section. As a teacher you can create your own projects and then use the built-in editor to type in your lesson.
- M. **Student management**: Refer to Adding Students and Assigning Robots to Students sections in this user guide.
- N. **Workspace**: If this says "Temporary Workspace" your coding changes are not being saved. Click **Projects \ My Projects \ Save Work**. Once you have saved your work, then all changes from then on are automatically saved. If you are making changes to a big project, always save your work as another project as a backup.
- O. **Projects**: There are three categories of projects.
 - a. **My Projects**: Is your personal saved work.
 - b. **Kai's Projects**: These are projects created by teachers that we have published or by us here at Kai's Clan.
 - c. **Community**: These are projects / lessons that you can create to share with others around the world.

- P. Menu:** Under this menu you can log out or view our privacy policy etc.
- Q. Map view:** Displays the robots on the map. The map changes depending of what mat you have on the floor. Map uses coordinates x & y. Students can move their robots to a precise position on the mat / map. Mouse over the mat to see the x & y position. Click on a robot to see it's x & y position in section S.
- If a robot is online it will be shown in blue 
 - if the robot is red  the robot needs charging,
 - If the robot is switched off, not paired or battery is flat then it will show as offline 
- R. Out of camera view:** Robots appear in this section if they
- Drive off the mat and out of view of the phone Kai's Eye.
 - A student is working with a Robot on his desk or is on the move with the robot.
- S. Robot Sensor Graph** – Click on an active  robot and this area will display the sensor bits that are currently setup on the robot. Click on the left and right arrows to page through the different sensors.
- T. Export Sensor Bit Data:** Clicking on this icon  will download all the sensor data that has been collected since you logged in. Use either Excel or Google Sheets to open and analyse the data and create graphs. Sensor data is not stored in Kai's Cloud.

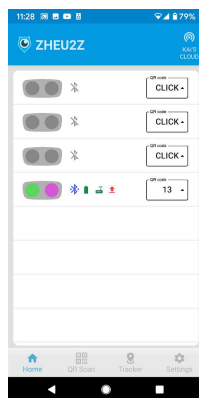
Kai's Eye Robot Tracker app

The Kai's Eye app does several tasks.

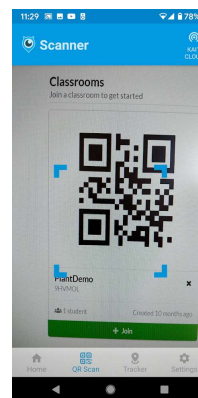
- Using Bluetooth pairs with your Kai Robots.
- Using the Robot Tracker function, this keeps track of the robots on the adventure mat. Much like how a self-driving car keeps track of the environment around itself.
- Using the phones internet connection communicates robot data and robot mat positions to your Kai's Cloud map.
- The QR scanner is used to scan your classroom QR code and then all robot data is sent to the classroom code of your Kai's Cloud Portal.



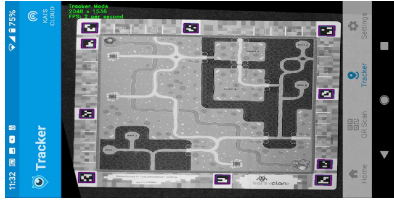
No robots paired.



1 robot paired.

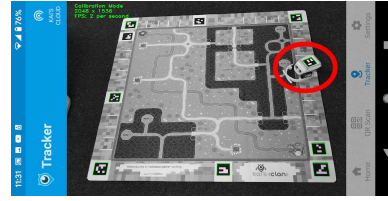


QR Scan class code.



Mat tracking good.

Notice how mat is aligned square to screen.

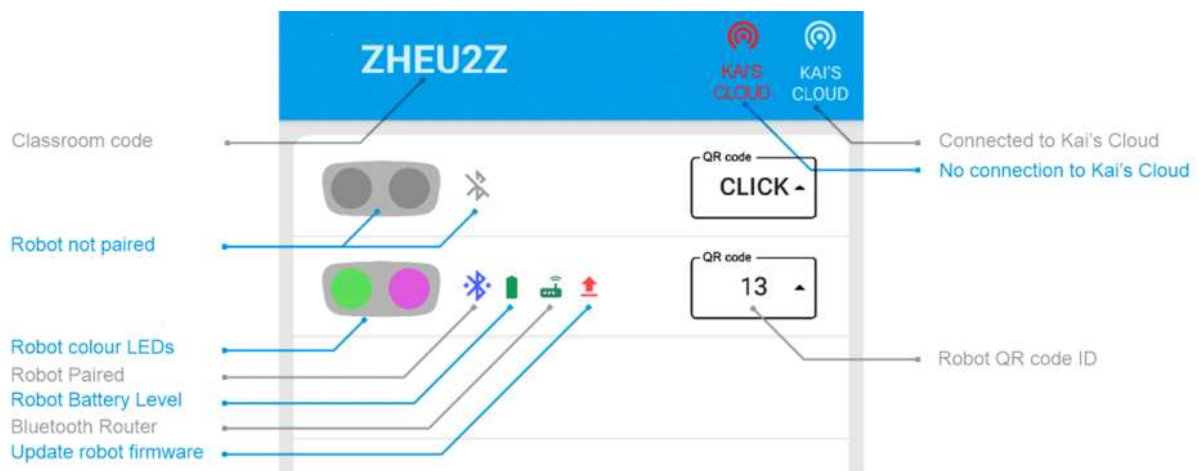


Mat tracking failed (because a robot is covering a mat QR marker).

App constantly beeps when tracking is lost.

 Place your phone/ tablet in landscape mode whilst in tracking mode

The phone requires a good Wi-Fi internet connection as all data from and to the robots is sent via the phones internet connection. No SIM card is required for the phone.



Combing 2 mats / classrooms together

By joining two Kai's Clan mats together allows different students in different geographic areas to work and collaborate over the internet, whether they are in the same classroom or different classrooms.

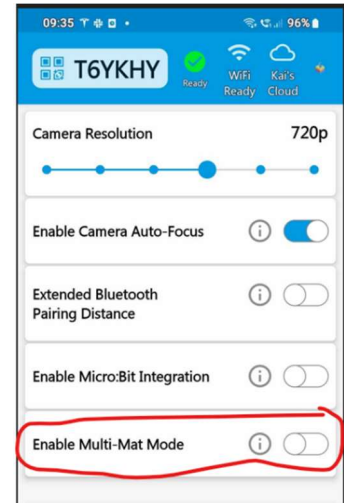
What you'll need: Two separate environments setup of the following:

Setup A

- 1 x Kai's Clan mat of the identical type to the other.
- 1 x Tripod with Kai's Eye App.
- Robots & QR markers that don't conflict with setup B.

Setup B

- 1 x Kai's Clan mat of the identical type to the other.
- 1 x Tripod with Kai's Eye App.
- Robots & QR markers that don't conflict with setup A.



Each setup must not have conflicting Kai robot numbers or conflicting QR marker numbers. Each setup must have unique numbering. E.g. Setup A has robots 1-5 and setup B has robots 6-10.

1. One teacher account will become the main account for managing all the robots and students in both mats. For the second mat/classroom that teacher needs to join as a student. (Only one teacher account is use for both setups)
2. On both phone's Kai's Eye apps, go to settings and enable "Multiple mat mode", then go to "Scan QR" code screen and have both apps scan the same "Classroom Code" from the main teacher account.
3. On Setup A phone Kai's Eye App, pair the robots e.g. 1-5 (delete any conflicting robot IDs with Setup B)
4. On Setup B phone Kai's Eye App, pair the robots e.g. 6-10 (delete any conflicting robot IDs with Setup A)
5. On the main teacher account add and allocate robots to the students for both setups.

Once both setups are running, then both mats and robots are joined and displayed as one mat.

Remember you can scale your robots in the virtual world if they appear too big!



Classroom variables aka global variables

A regular variable is only available to you and not available to other users/students.

Note: If your classroom variable will not fit into another code block, it's most likely due to you are trying to insert a string type into a integer only type block.

When a

classroom variable is created, it is available to all students that have joined your classroom.

Note: Classroom variables are always created as string/text type variables.

The classroom variables work very differently to local variables.

Note: Sometimes you'll need to refresh your browser page, if you don't see the changes to classroom variables being reflected.

- Local variables
- Classroom variables

	Integer (numbers)	String (text)	Classroom wide
--	-------------------	---------------	----------------

Local variables	Yes	Yes	No
Classroom variables	Needs to be converted from a string to an integer	Yes - always	Yes

Example behaviour of a string vs integer:

String: "1" + "2" = "12"

Integer: 1 + 2 = 3

Classroom variables are always set as "strings", this means to use them as an integer, you need to use the "string to number" function, then insert the classroom variable into the function as the image below.



Classroom Variables can be set as read only or read & write by other students in the classroom.

Why read only? Let's say you create a classroom variable called "day-night" and you as the teacher want to control when it's day or night for the students. You don't want the students to be able to change the state of the "day-night" variable, so create the classroom variable as read only.

Then set the classroom variable "day-night" to = 0 (example day = 0 and night = 1)

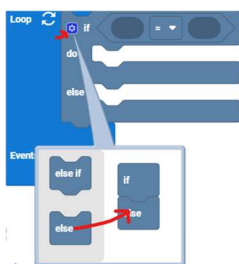
In your teacher Blockly set the variable as 0 or 1



Create a new Class Variable

☐ Read Only?

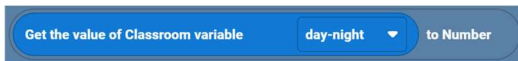
In the students Blockly create a logic IF statement with an "else" by clicking the gear icon and drag else below the popout if.



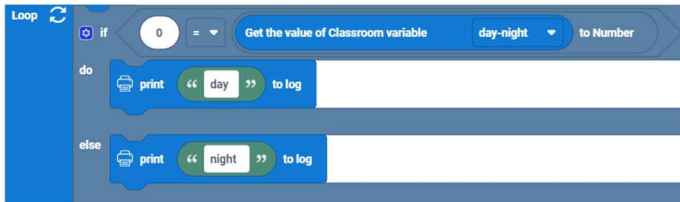
Then lets convert the classroom variable to a number as it's currently a string.



Then drop the “Get classroom variable” into the “” number block.



So it should look like this in the student Blockly.



Troubleshooting

Kai Robots are designed to be easy to use right out of the box, the Kai toolbox has a low floor and high ceiling design. Like most technology they do have issues occasionally.

Grippers not opening or closing correctly	Try to loosen the screws underneath the grippers as they might be too tight. If that doesn't help, try realigning the grippers.
Robot not switching on	Have you removed the internal plastic sleeve that covers the battery, to protect the battery during shipping.



Need help?

Contact support@kaiseducation.com

General Information

Product Disposal for End of Life

The symbol on the product or its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste for recycling, please contact your local authority.

Software

Your Kai's Clan product connects with special Autonomous Works Limited copyrighted software to control its operation. Parts of this software may contain copyrighted elements that are licensed under the GPL, MIT, and Creative Commons licenses among others. The Kai's Clan product contains proprietary firmware developed and copyrighted by Autonomous Works Limited.

Copyright © 2019 Autonomous Works Limited. All Rights Reserved.

Registered Trademarks: Kai's Clan™ and the Kai's Clan logo are registered trademarks of Autonomous Works Limited.

All other trademarks mentioned in this guide are the property of their respective owners.

WARNING: Before using this product, read this user's manual to ensure correct usage through understanding. Incorrectly handling this product could possibly result in personal injury or physical damage. The manufacturer assumes no responsibility for any damage caused by mishandling, that is beyond normal usage defined in these manuals of this product.

NOTE: The information contained in this user guide is subject to change without notice. The manufacturer assumes no responsibility for any errors that may appear in this user guide.

Incorrect handling could result in fire, injury, burn or vision problem.

Photosensitive Epilepsy

A small percentage of people (about 1 in 4000) may have severe dizziness, seizures, eye or muscle twitching or blackouts triggered by light flashes or patterns, and this may occur while they are looking at flashing lights – even if they have never had a seizure or blackout before or have no history of seizures or epilepsy. Such seizures are more common in children and young people under the age of 20. Anyone who experiences any of these symptoms should discontinue use of the product and see a doctor. Anyone who previously has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should see a doctor before using the product.

Always:

- Always keep your Kai robot in sight during operation to avoid injuries or damages to people, animals or property.
- From time to time, check the Kai robots for potential hazards such as cracked, damaged or otherwise broken parts. In the event of such damage, do not use the product until it can be replaced or repaired.
- Drive your robot on the mat included, it also works best on smooth, flat and hard surfaces, such as desks, tile, wood floors and concrete.

Rechargeable Lithium-Ion Batteries

The Kai's Clan Robots come with Lithium-Ion batteries.

- Do not submerge or place near liquids or place or connect foreign objects. Only use the supplied USB 4 to 1 charging cable.
- Your batteries should arrive fully charged; however, we recommend that you charge your robots batteries before first use. This will ensure the batteries are fully charged and will maximize their future life.
- Recharge the batteries as soon as possible after each use to ensure they maintain their capacity.
- Batteries will self-discharge approximately 5% every month, so top up your batteries every three months if you are not using your system.
- Do not leave your batteries connected to the charger once they are charged.
- Do not leave the batteries in a discharged state, this will cause them to fail.
- Do not consistently over or under charge the batteries, as this will cause them to fail. Overcharging batteries may cause them to explode.

Warning: You must read these safety instructions and warnings carefully before charging or using your batteries.

Lithium-Ion batteries require less care and are less dangerous but failure to exercise caution while using Lithium-Ion batteries and comply with the following warnings could result in battery malfunction, electrical issues, excessive heat, fire, or injury and property damage.

General guidelines and warnings

Stop using or charging the battery immediately if the battery becomes or appears damaged, starts to balloon or swell, leaks, becomes deformed or gives off an odour, exceeds a temperature of 70°C (160°F), or if anything else abnormal occurs. Disconnect the battery and observe in a safe area outside of any building or vehicle for at least 45 minutes, as a damaged battery can experience a delayed chemical reaction that could possibly result in fire.

- Never disassemble, modify, puncture, shock, drop, crash and/or short circuit the battery. Leakage, smoke emission, ignition, explosion or fire can occur, which may result in personal injury or property damage.
- Never charge the battery while inside a vehicle.
- Always use a dedicated USB charger only.
- DO NOT leave the battery and charger unattended during use.

Never drop batteries. • Never attempt to charge “dead” or damaged batteries. • Never charge a battery if the cable has been pinched or shortened. • Never allow minors to charge or use battery packs without adult supervision. • Never charge near moisture, extreme temperatures, flammable or combustible materials. • Never charge or store batteries in extremely hot or cold places (recommended between 10°-26°C/50°-80°F), leave in a hot environment (inside an automobile in hot weather), or leave in direct sunlight. • Never place or carry batteries in your pockets or clothing. • Always use dedicated Lithium-Ion batteries. • Always inspect the battery before charging.

• Always disconnect the battery after charging. • Store the battery at room temperature in a cool or shaded area (ideally between 10°-26°C/50°-80°F). • Batteries should be stored in a vented, fire-resistant container. Storage temperatures should not fall below 0°C/32°F or above 54°C/130°F. Damaged batteries are extremely sensitive to temperature fluctuation and care should be taken in their immediate disposal. High temperatures may cause fire, even with undamaged batteries.

Lithium-Ion battery disposal

Lithium-Ion batteries require special handling for safe disposal. The following steps must be taken to avoid damage or injury to yourself, your property or anyone who comes in contact with the battery. If the battery is undamaged but no longer useful:

1. Discharge the battery.
2. Leave the battery uncharged and retest the battery after 24 hours. If the battery is over 2.0V, repeat the discharge procedure until the battery is below 2.0V.
3. Place electrical tape over opposite sides of the battery.
4. Place battery in a sealed plastic bag and place plastic bag in a vented, firesafe container.
5. Use a fire-safe container to deliver battery to a e-waste recycling center authorized for Lithium-Ion batteries.

Lithium-ion (li-ion) batteries contain a variety of chemicals. Improper disposal has significant consequences, such as environmental pollution and loss of (material) resources.

Lithium-ion batteries can be recycled, but only at permitted treatment facilities. When discarded, they must be disposed of at a household e-waste collection point or battery-recycling drop off location. Of course, the electrical hazard needs to be carefully considered.

FCC

Contains: FCC ID: 2AT2PAW-KCR01

This device complies with Part 15 of the FCC Rules Sub-Part B and C. Operation is subject to the following two

conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B and C digital service, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

“Made for iPod,” “Made for iPhone,” and “Made for iPad” mean that an electronic accessory has been designed to connect specifically to iPod, iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod, iPhone, or iPad may affect wireless performance.

iPad, iPhone, iPod, iPod classic, iPod nano and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries. iPad Air, iPad mini, and Lightning are trademarks of Apple Inc.

Android™ is a trademark of Google Inc. Use of this trademark is subject to Google Permissions.

The BLUETOOTH word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Autonomous Works Limited is under license. Other trademarks and trade names are those of their respective owners.

Governing Law and Arbitration.

This Warranty shall be governed by the laws of the Auckland, New Zealand. Any claim or dispute in connection with this Limited Warranty shall be resolved in a cost-effective manner through binding non-appearance-based arbitration.

The arbitration shall be initiated through an established alternative dispute resolution provider mutually agreed upon by the parties. The alternative dispute resolution provider and the parties must comply with the following rules: a) the arbitration shall be conducted by telephone, online and/or be solely based on written submissions, the specific manner shall be chosen by the party initiating the arbitration; b) the arbitration shall not involve any personal appearance by the parties or witnesses unless otherwise mutually agreed by the parties; and c) any judgment on the award rendered by the arbitrator may be entered in any court of competent jurisdiction. If the foregoing arbitration clause does not apply for any reason, you agree to submit to the personal jurisdiction of the state courts located within Auckland, New Zealand.