iPal® User Manual

For Children's Education, Families, Elder Care, and Retail/Hospitality

Official Website www.ipalrobot.com

Twitter – www.twitter.com/avatarmindinc?lang=en

Facebook -- www.facebook.com/AvatarMindInc

This manual may not be reprinted without permission

Copyright© 2017 Nanjing AvatarMind Robot Technology Co.,Ltd Copyright Reserved

Contents

1. Introduction to iPal 4
2. Making friends with iPal 5
3. Accessories 6
4. Hardware 7
   - 4.1. A brief tour of iPal 7
   - 4.2. On/Off Switch 9
   - 4.3. Screen 10
   - 4.4. Components 11
   - 4.5. Charging 12
5. Getting Started 13
   - 5.1. Environmental Considerations 13
   - 5.2. How to move iPal 13
   - 5.3. Setup Wizard 13
6. iPal Applications 17
   - 6.1. How to use iPal applications 17
   - 6.2. Settings 19
     - 6.2.1. System Settings 19
     - 6.2.2. Robot Settings 23
     - 6.2.3. User Settings 25
   - 6.3. Examples 25
     - 6.3.1. Stories 25
     - 6.3.2. Music 26

6.3.3. Games 27
6.3.4. Camera 27
6.3.5. Gallery 28
6.3.6. Education 29
6.3.7. Calendar 30
6.4. iPalProgrammer 32
6.4.1. Introduction 32
6.4.2. Modules 32
6.4.3. Operations 33
6.4.4. Menu 35
6.4.5. Delete 36
6.4.6. Download Template 37
6.5. Man-iPal Interaction 37
6.5.1. Introduction 37
6.5.2. Face Recognition 38
6.5.3. Natural User Interface (NUI) Settings 41
7. Download Applications 43
7.1. App Store 43
7.2. Download 44
7.2.1. App List 44
7.2.2. Search App by Category/Filter 44
7.2.3. Download & Install 45
7.2.4. Use New App 45
8. iPal Maintenance 46
8.1. iPal 46
8.2. Charger 46

9. Warranty 47
9.1. Security 47
9.2. Usage 48
9.3. Storage 49
10. FCC Warning 49
10.1. FCC Warning 49
10.2. RF Exposure Statement 50
Appendix 51
Ⅰ: iPal Specification 51
Ⅱ: Charger Specification 52
Ⅲ: Others 53

1. Introduction to iPal

iPal is a fully functional humanoid robot that is 3.5 feet tall. It has many motors, microphones, cameras, sensors (infrared, ultrasound and touch) which enable iPal™ to be aware of its surroundings and to facilitate interactions with and between humans

iPal is an open system based on the Android operating system with extensions for motion, sensors and natural language conversation, allowing a wealth of third party applications to be delivered on a robot.

For children and families, iPal is an affordable social robot that is a friend, teacher, and safety monitor for children. iPal provides educational content in an engaging manner that supports social development and encourages interest in science and technology. iPal cooperates with parents to provide better quality of life for children and gives them a head start in education. iPal is not intended to be a standalone babysitter or a replacement for parents or finding friends their own age -- no robot can or should take the place of parents or friends. But iPal can make the everyday lives of parents a little easier and provide a much richer experience for children compared just to sitting in front of a TV.

For elders iPal™ is a constant companion that supplements personal care services and has the potential to provide security with alerts for many medical emergencies. As an elder companion and safety monitor. iPal can facilitate social interaction and companionship for

elders who may not be able to get out as much as they'd like due to physical limitations. iPal can aid in health and safety monitoring, reminding elders to take their medications as prescribed and allowing caregivers and loved ones to check in on individuals through the iPal smartphone app.

Other versions of iPal are in development for children with special needs (e.g., autism), hospitality, retail, home security, and more.

AvatarMind also offers the iPal platform for 3rd party developers. The goal of the iPal™ Robot Development Platform is to provide partners with all the tools and support needed to enable them to quickly and efficiently modify iPal's software and content for their specific use. They can then deploy and market their own robotic branded product at a small fraction of the cost of developing their own robot. Details are given in the iPal platform section of www.ipalrobot.com.

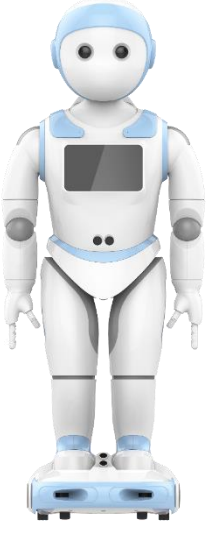
2. Making friends with iPal

iPal is designed with a friendly, non-threatening demeanor, and has multiple sensors to assure safe human interaction. iPal has a conversational spoken language interface, facial expressions, full arm/hand movement, and has the potential to sense the mood of people. iPal encourages physical activity and enables people to stay connected with their friends and the world.

3. Accessories

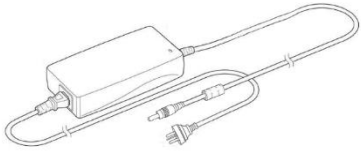
To begin, please verify that you have received the items or accessories listed as below:

- iPal robot, charger, warranty card, user manual



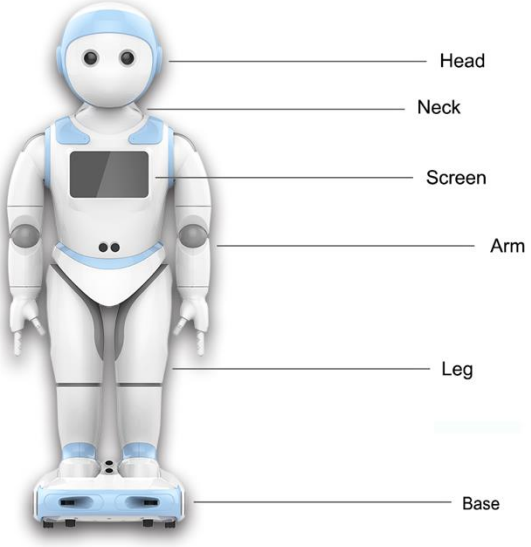
iPal robot

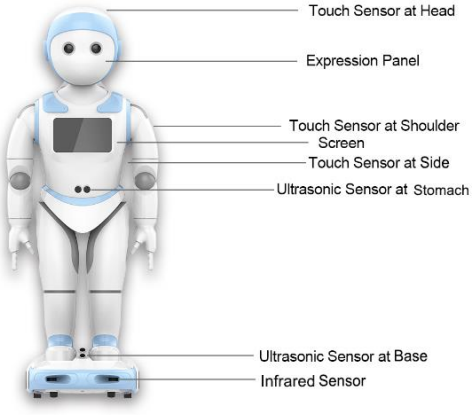
Charger (including wire)

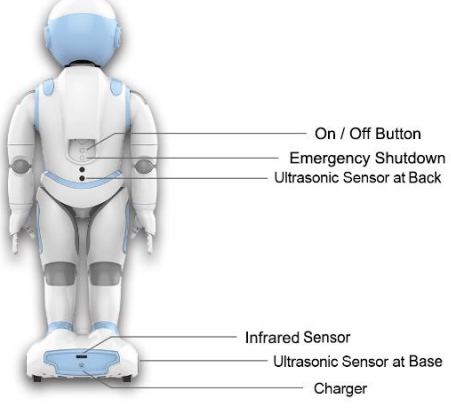


4. Hardware

4.1. A brief tour of iPal

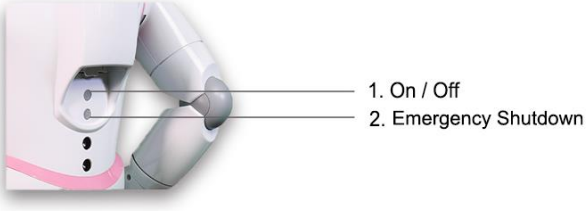



Touch Sensor at Head
Expression Panel
Touch Sensor at Shoulder
Screen
Touch Sensor at Side
Ultrasonic Sensor at Stomach
Ultrasonic Sensor at Base
Infrared Sensor


On / Off Button
Emergency Shutdown
Ultrasonic Sensor at Back
Infrared Sensor
Ultrasonic Sensor at Base
Charger

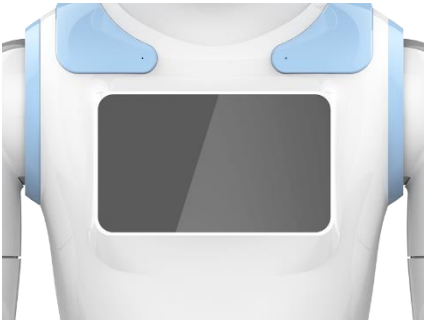
4.2. On/Off Switch

iPal has 2 buttons at the back, an on/off button and an emergency shutdown button. To turn on iPal hold down the On/Off button for 2 seconds. To turn off iPal with the normal shutdown procedure, hold down the On/Off button for 2 seconds. For emergencies, press the emergency shutdown button to immediately power off iPal

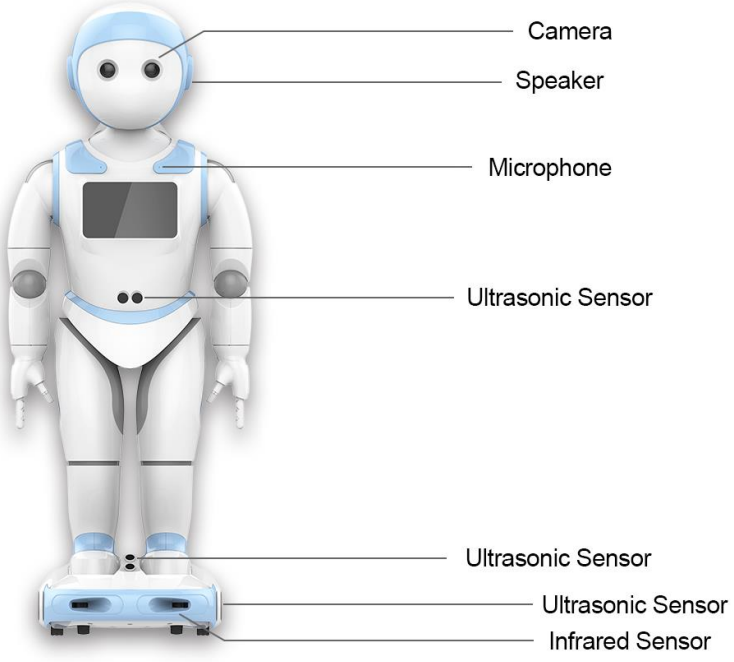


4.3. Screen

The screen is on iPal's chest can be used to change settings, start and stop applications, and control iPal in various ways. Details are given later in this manual.

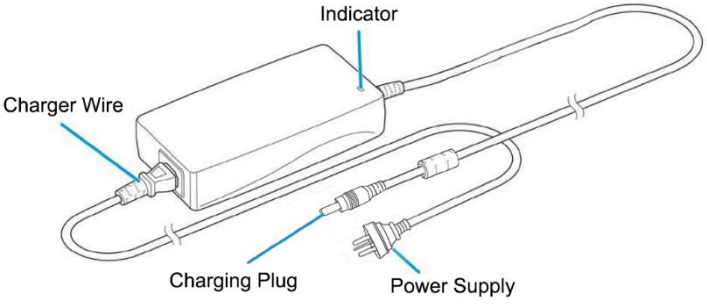


~~4.14.~~4.4. Components



~~4.15.~~4.5. Charging

For security and safety reasons, when charging iPal is automatically turned off or put in screen protection mode.



Charging steps:

- Plug in charger to power source
- Confirm indictor is green
- Plug in charger at back of iPal base
- While iPal is charging the eyes blink yellow
- iPal is fully charged when the eyes turn green

5. Getting Started

~~5.6.~~5.1. Environmental Considerations

- iPal moves best on a flat and dry surface. Movement is slower on thick carpet.
- Within a 50 cm range, people or objects may affect iPal's movements.
- Outdoor use is not recommended.

~~5.7.~~5.2. How to move iPal

Steps for moving iPal:

- ***Do NOT pick up the iPal by the head or arms***
- To carry iPal use the handle in back or by holding the body
- You can also push iPal forward on its wheels

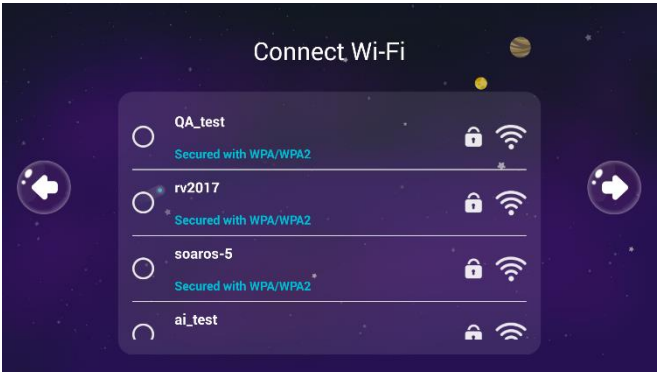
~~5.8.~~5.3. Setup Wizard

When you first turn on iPal, a Setup Wizard appears on the screen to guide you through the setup process.

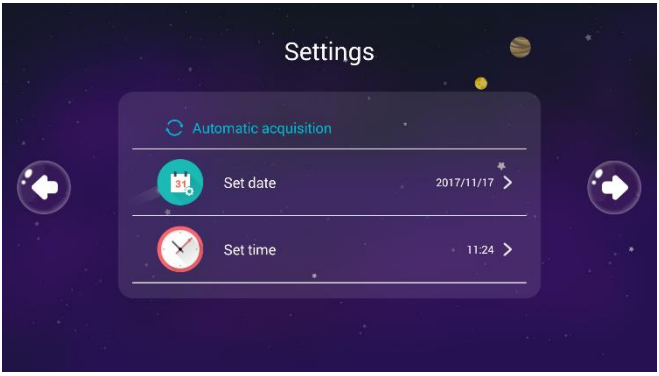
- Select language and press the arrow to continue

- If you agree with the service policy, select that option click the arrow to continue

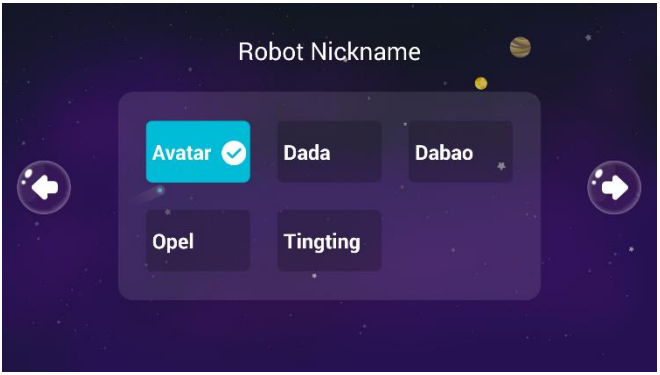
- Connect to a WiFi network. You can skip this section and connect to a network later using Settings. Some internal functionalities require a network connection, so connecting to network is highly recommended.

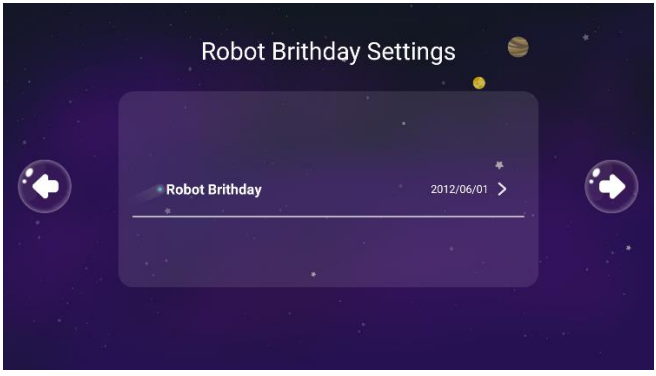


- Set time and date



- If desired, give iPal a nickname and birthday.


Robot Nickname
Avatar
Dada
Dabao
Opel
Tingting


Robot Brithday Settings
Robot Brithday
2012/06/01

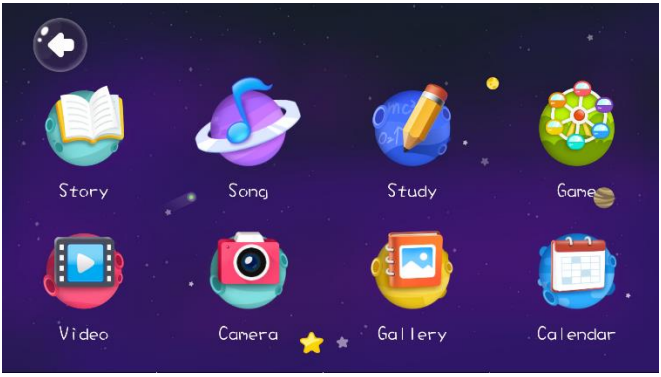
6. iPal Applications

iPal has a wide variety of bundled applications. Simply touch iPal's screen to activate an application.

6.1. How to use iPal applications

- After you complete the setup procedure, or subsequently when you turn on iPal, the home screen below appears.
- Along the top it shows the time, the WiFi strength, and the charge level.

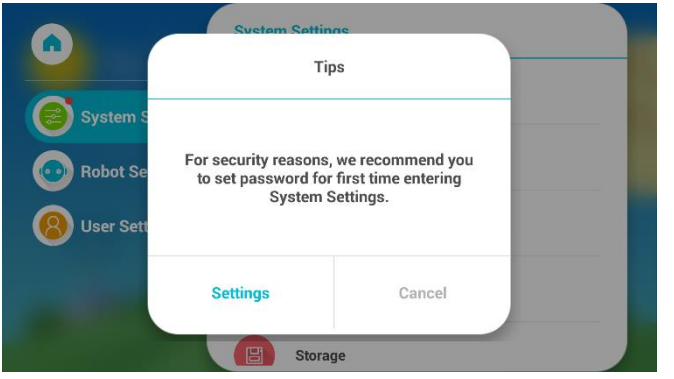
- Touch the "APP" button to show applications and content.



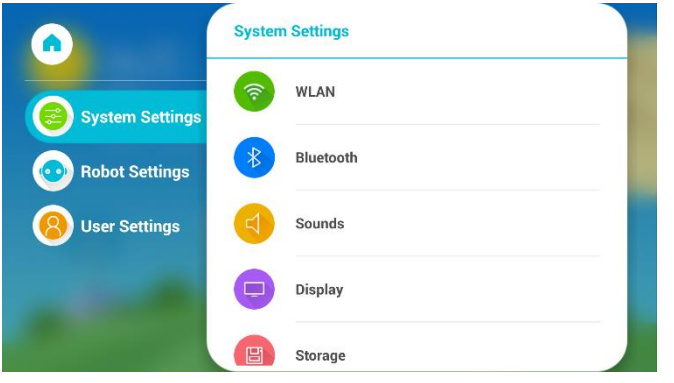
- To get started, touch the songs icon (you may need to swipe left), then you will see a selection of songs. Touch a song icon to have iPal play that song.
- To access additional applications swipe left or right on the screen.
- Touch an icon to start an application. In some cases such as “Game,” touching the icon takes you to a sub-directory.
- If you want to stop an application or playing content, simply touching iPal’s head will pause the current application.

6.2. Settings

By swiping left on the screen above you will see the Settings icon. When first entering Settings, you will be asked to set a password for iPal. This is optional but recommended

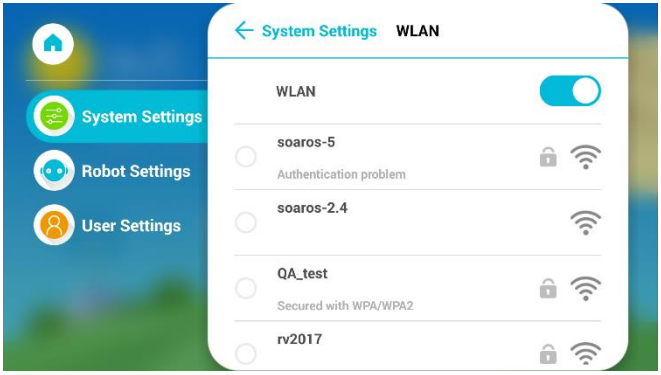


6.2.1. System Settings

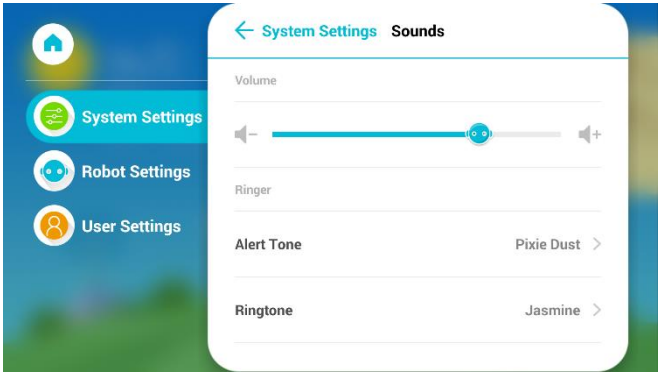


- WLAN

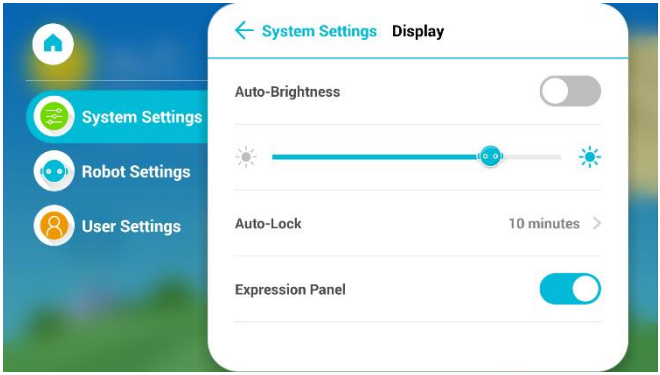
User can select or change a WiFi connection



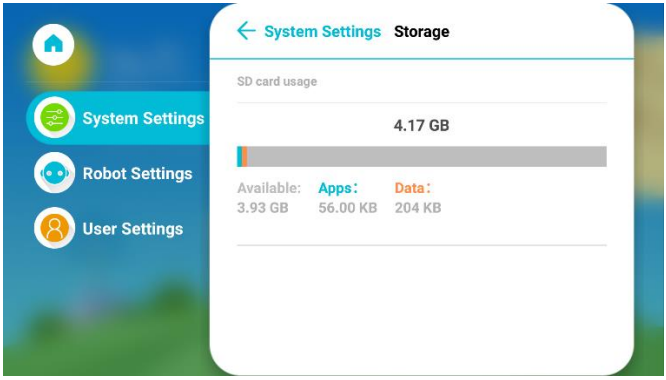
- Bluetooth: search and pair Bluetooth devices
- Sounds: adjust volume and tone



- Display: adjust screen brightness; set sleeping time, turn on/off expression panel (controls the mouth and eyebrow display).

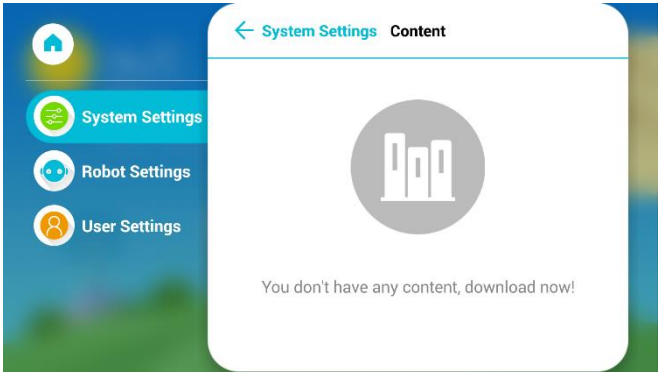


- Storage: Shows the storage space usage on the SD card or enables the deletion of data on the SD card

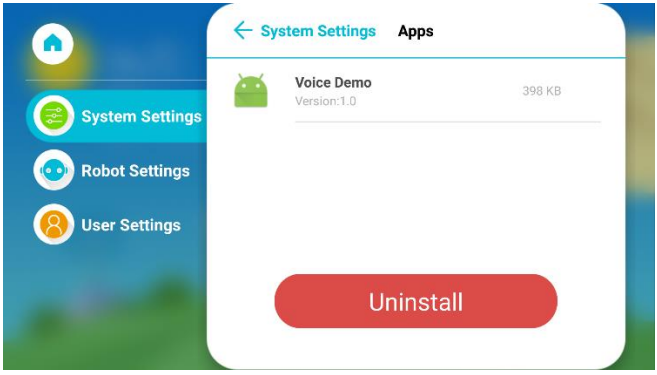


- Content

Manage download content. User can select unneeded content and delete.



- Apps: manage new installed applications

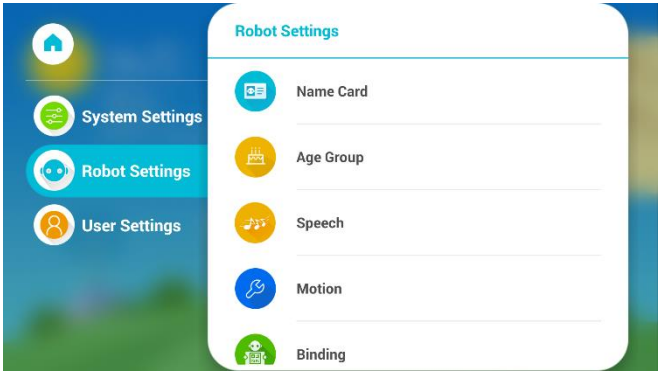


- Security: set or change password
- Language: supports simplified Chinese and English
- Time & Date: set current date, time and time zone
- About:
  - System Details: shows iPal software and hardware version.
  - Terms of Use: specifies iPal terms in detail.

- Privacy: describes privacy terms for iPal.
- System Update: checks if a new version is available to download.
- Reset to Default: reset iPal to factory status (*WARNING - All content and applications you have added to **iPal** will be deleted, including Photos, video and other resources*).

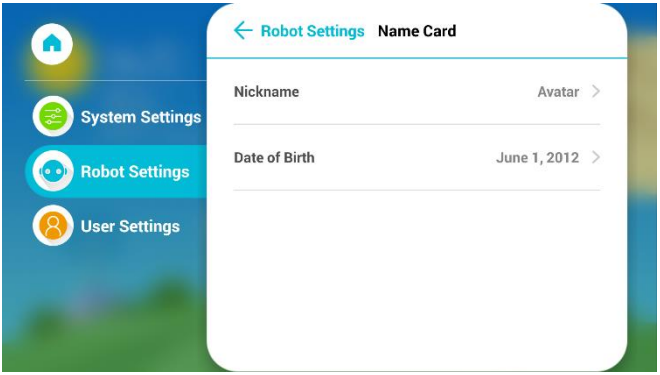
6.2.2. Robot Settings

The robot settings are described below:

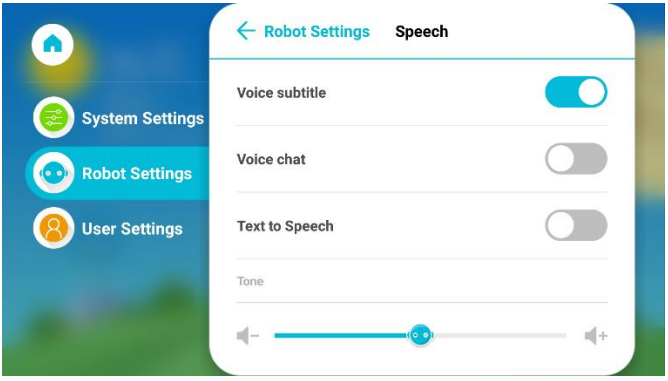


➢ Name Card

Edit iPal's nickname or birthday.

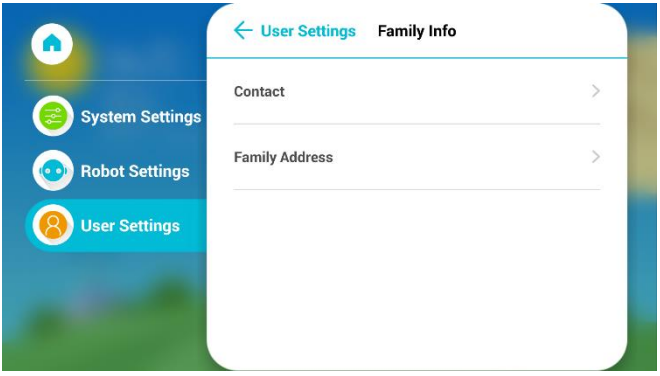


- Speech: edit voice pitch and speed for TTS



6.2.3. User Settings

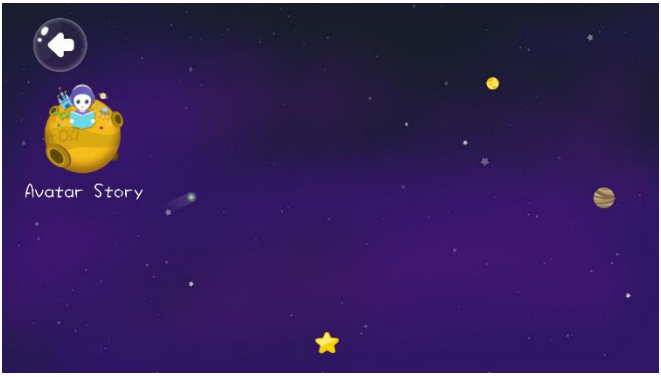
User can edit family information in this section.



6.3. Examples

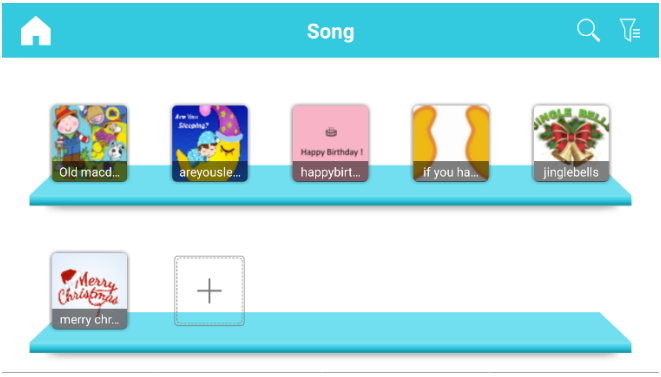
6.3.1. Stories

- Click icon to enter Story folder
- Click Avatar Story icon to browse stories



6.3.2. Music

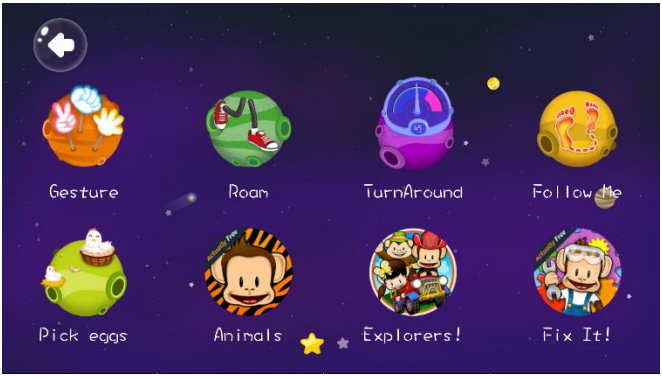
- Click icon to enter Song archive
- Browse music by swiping up and down on screen



- Select one to play by touching its icon.

6.3.3. Games

- Click icon to enter Games folder
- Browse all games



- Slide left to see second page, click “More icon” to enter Store for more games

6.3.4. Camera

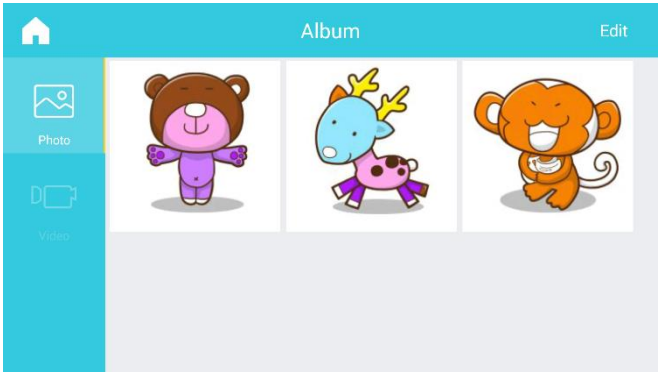
- Click icon to open camera.

- The screen shown below appears.

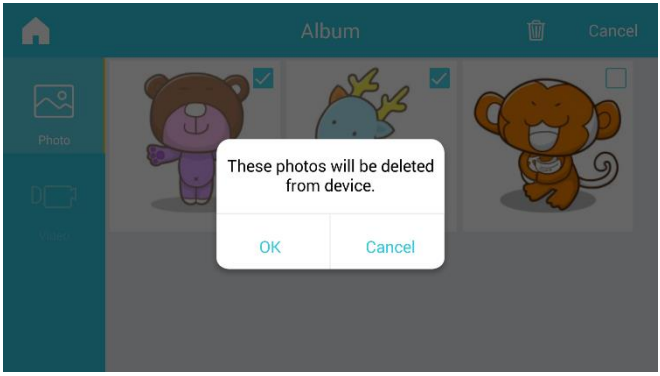
- Click the Camera icon at right to take photo.
- Click red button at right to take video.

6.3.5. Gallery

- Click icon to enter Gallery.
- Check photos and videos.

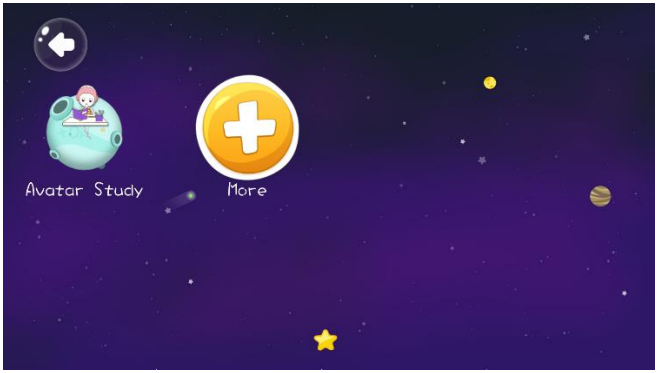


- Click “Edit” button at top right corner to select photos or videos to delete.



6.3.6. Education

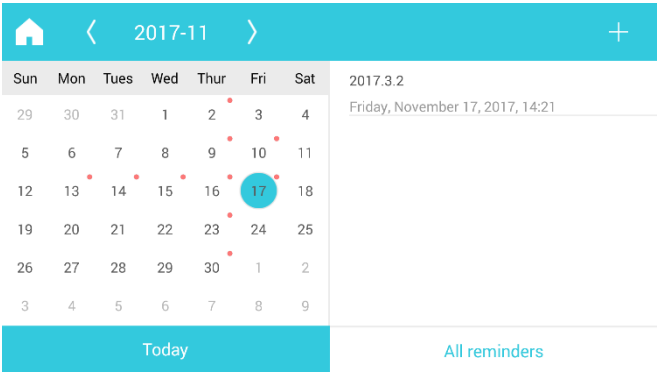
- Click icon to enter Study archive
- Click Avatar Study to browse educational resources



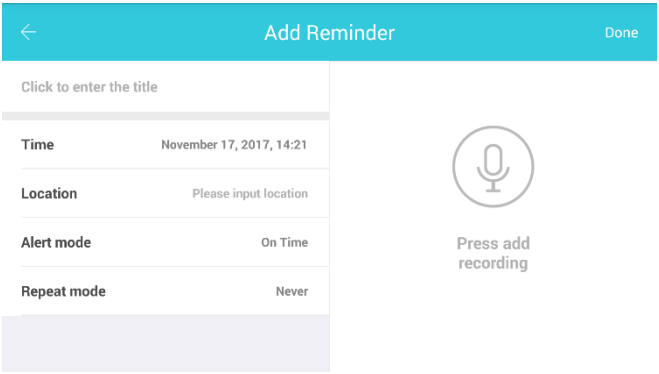
- Click More icon (white plus icon with yellow background in picture above) to enter Store for more educational resources

6.3.7. Calendar

- Click icon to enter Calendar application.
- View calendar and browse alerts.



- To set a new alert: click “+” symbol at top right corner.
- Edit alert content: set title, time, place and type or added records. Set alert by clicking button at top right corner.



6.4. iPalProgrammer

6.4.1. Introduction

iPalProgrammer is a simple programming language that enables you to create iPal activities by dragging and dropping.

- Go to home page -> APP -> Other
- Click the icon to start iPalProgrammer.

6.4.2. Modules

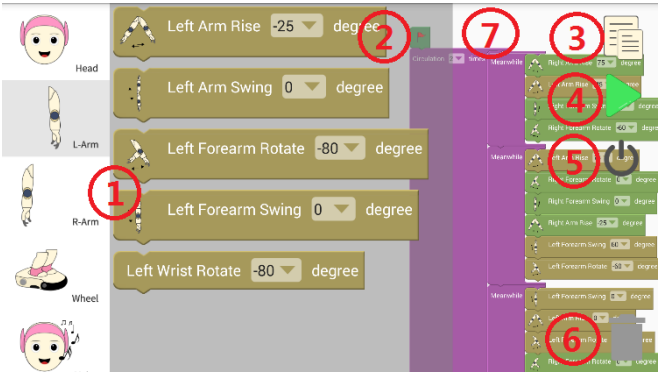
iPalProgrammer is intended help teach programming concepts to young children, and to the young at heart. It provides you with a simple interface to drag and drop iPal's actions to create iPal activities.

Note: Some actions cannot be performed simultaneously, for example you can't raise and lower an arm at the same time.

1. **Actions: The left hand column shows** iPal's actions. Combined actions cannot be put in simultaneous block.
2. **Start Icon:** Blocks connected to start icon directly or connected to those which are attached in sequence to the start icon are valid. In some case there may be invalid motions (for example

iPal cannot do two opposing actions at the same time. Blocks with invalid operations are set to a grey color.

3. **Menu:** Load/Save workspace
4. **Run:** iPal will run logic in current workspace
5. **Exit:** exit application
6. **Delete:** drag blocks to trash to delete.
7. **Workspace:** block area, user drags blocks into workspace and format valid logic



6.4.3. Operations

➢ **Workspace**

Workspace is a rectangular area with white dots background. User clicks action button to pop up a new window at right side, shown as 2 above. Drag a block to workspace and connect to start icon. Only valid blocks can be created activated, any in grey and not valid.

Some blocks represent a motor angle where you can type in the angle

desired.

Input angles are absolute. For example, suppose you raise the left arm by 30 degrees and raise again by 30 degrees. Each input of 30 degrees defines the same for the motor default position. So as for the first command, iPal's right arm rises by 30 degrees, but for the second one, iPal's right arm stays the in the same place.

- **Voice interaction**

The voice interaction module can read music resources from a local device. Music format is mp3.

In addition, iPalProgrammer has some internal voice resources so that iPal can speak simple words through TTS.

- **Expression**

iPal can display expressions by controlling the eyebrows and mouth, such as happy or angry.

- **Combined Actions**

iPalProgrammer provides the capability to combine actions–, for example moving an arm and showing an expression at the same time. Combined actions are a series of motion sequences with specific meanings. Choose Control on the left hand side (scroll down) and then select Meanwhile. Multiple operations can be stacked up in meanwhile.

- **Control Logic**

.

- **Run**

When user clicks the run button (green triangle), iPal will run a script which activates all the valid blocks in sequence. Screen will pop up a window with “Running” hint.

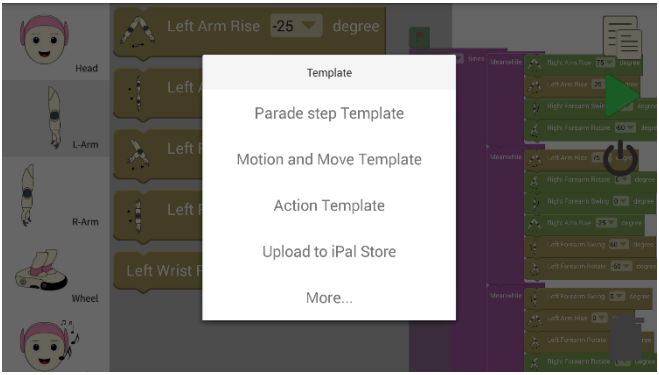
- **Exit**

Click the exit button to exit iPalProgrammer.

6.4.4. Menu

- **Template**

iPalProgrammer provides 3 simple templates internally: parade steps, expression & move, and action. Click menu to select template.
User can also upload their own programming to iPal store. If upload is approved by admin, others can download your programming as custom template.



- **Save Template**

Custom programming can be saved. User can long click Menu button and screen will pop up a dialog, informing user to type in filename. Currently workspace will be saved to local storage.
To replay a saved activity, use the More button.

6.4.5. Delete

To delete single block or whole workspace in iPalProgrammer.

- Drag to Trash
- User can drag blocks to trash icon to delete. When dragging to trash icon, trash icon will open the cover, then release to delete.
- Long clicking delete button will show user the hint to clear workspace. If confirmed, iPalProgrammer will clear workspace and give user a blank one. The **Start icon cannot be deleted**.

6.4.6. Download Template

iPal App Store collects templates for iPal activities from users and provides download links. Please refer to iPal App Store for more information.

6.5. Man-iPal Interaction

6.5.1. Introduction

This functionality is specially designed for Elder Care.

Man - iPal interaction (NUI) means iPal can react to people's commands or detect signals from the surrounding environment. It is possible for iPal to receive information through vision, touch or hearing, then give the corresponding response. This often includes face recognition.

The face recognition module, it is divided into multiple parts, including register face, identify face, or edit. In scene module, user can select a scene mode for this face.

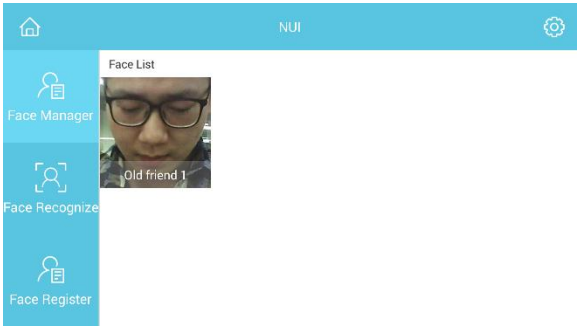
- Go to home page -> APP -> Other

➢ Touch man-iPal interaction icon to enter man- iPal interaction.

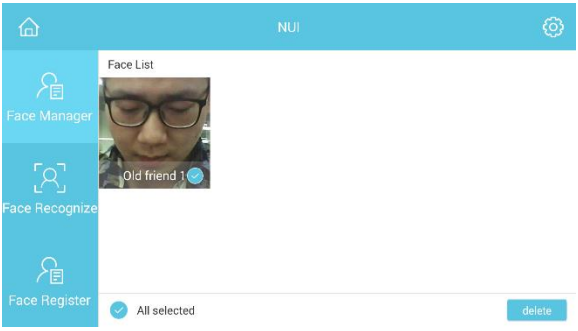
6.5.2. Face Recognition

➢ **Face Manager**

Face Manager is used to manage registered human faces. User should register new face before using face recognition.



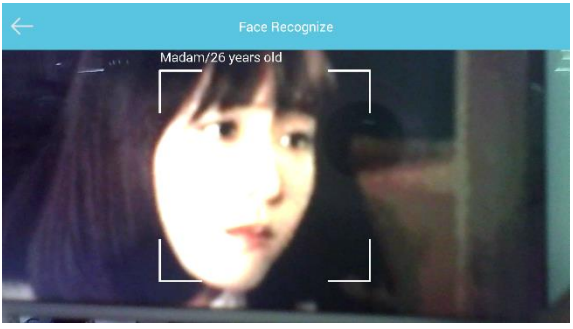
User can manage registered faces by clicking any face. This will enter the edit mode. User can select faces to delete.



➢ Face Recognition

Face recognition is used to capture human's face. If captured face is registered in database, it shows user with matched name, gender and age. If this face is new, it detects gender and age.

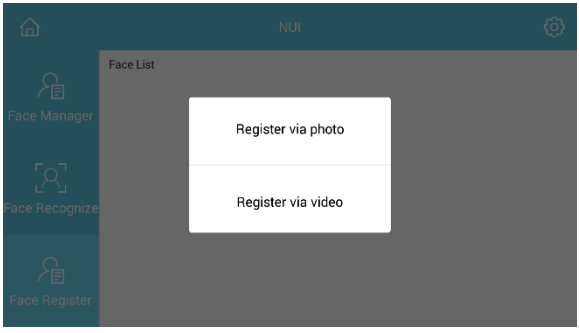
The second option at left menu will enter face capture page. This page will trigger camera.



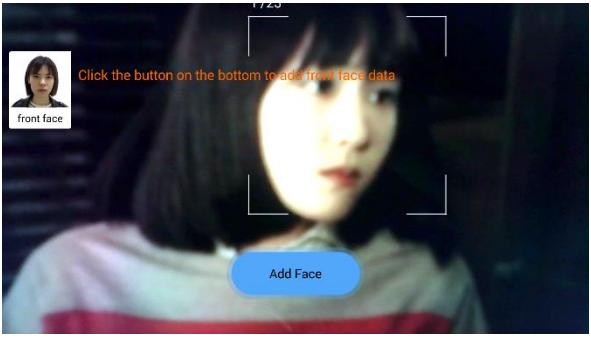
➢ Register New Face

Click the last option at left menu to register a new face for recognition.

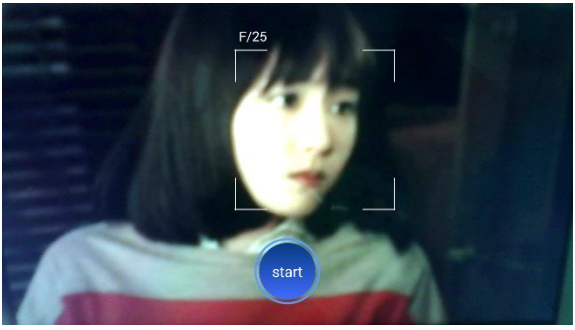
Two types are supported, by camera or video. Please follow the instructions for capturing a face by video.



Record data for front face, side face, raise head and lower head by camera, and type in name.



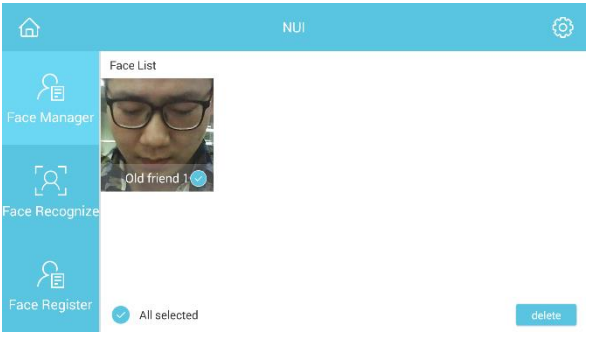
Using video to capture face, record a video at least five seconds long (rotate head when recording), and type in name when video is completed.



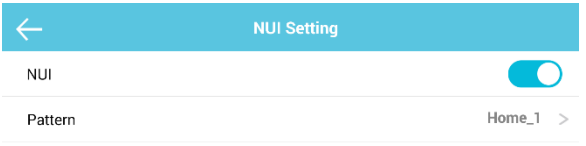
6.5.3. Natural User Interface (NUI) Settings

➢ **Settings**

Single click the setting button at top right corner of NUI home page below to enter NUI Settings page.



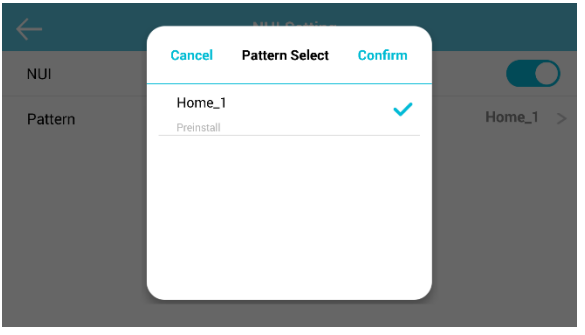
NUI Settings page is shown below:



NUI switch is used to enable/disable NUI functionality. If disabled, iPal will not detect human face by camera.

➢ **Pattern**

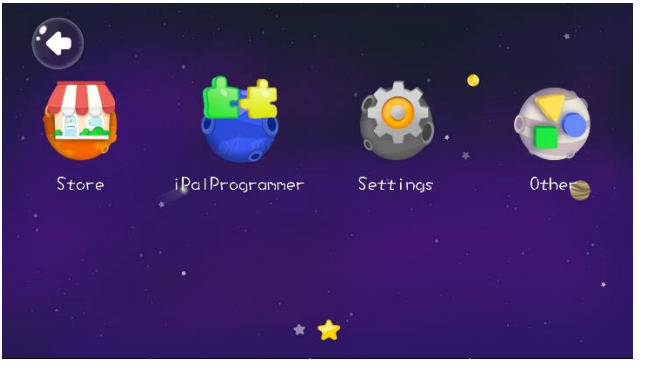
Pattern is used to define multiple application~~s~~ scenarios for NUI. For example, if iPal detects Tom's face and current scene is home, iPal will wave hands to Tom. On the other hand, if scene is school and also detects Tom, iPal may say Hello to Tom. This means the detection of a face can have different actions under different scenes.



7. Download Applications

7.1. App Store

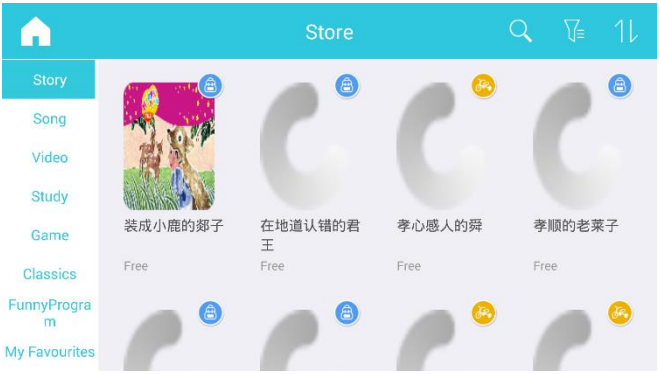
- Start from the screen reached when you hit “APP” on the home page. You may also need to swipe left



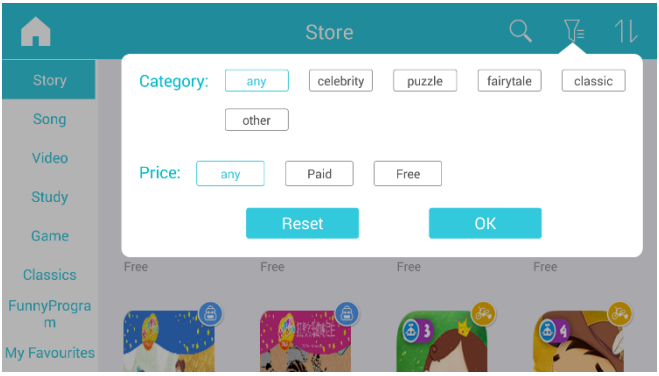
- Click icon to enter App Store

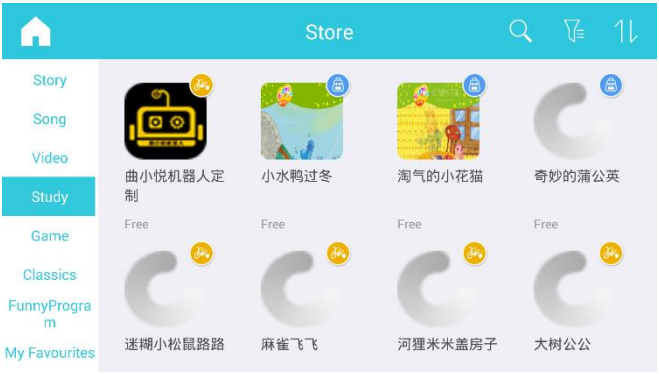
7.2. Download

7.2.1. App List



7.2.2. Search App by Category/Filter





7.2.3. Download & Install

Applications may be downloaded to different folders on categories. For example: applications under Story category will be downloaded to Story folder. Music applications to Music folder.

7.2.4. Use New App

When downloaded just click the new app to start it.

8. iPal Maintenance

8.1. iPal

- Do not use polishing liquid, alcohol spray or any other flammable substances on iPal.
- Do not attempt to disassemble iPal, it requires special tools to assemble.
- Maintenance:
  - Make sure charger is unplugged.
  - Shutdown iPal using the upper On/Off (upper) button on iPal's back.
  - Use dry towel to clean iPal.
  - Make sure that iPal is totally dry.
  - Occasionally clean iPal's base as it may be affected by dust or hair.

8.2. Charger

- If charger is covered with dust, please unplug and clean it with dry towel.
- Please keep charger out of the reach of children.

9. Warranty

Damages on iPal or charger because of user violating the maintenance steps or abusing iPal may void the warranty. AvatarMind Robot Technology will not be responsible for any damage to iPal or user injuries due to user violating the guidance in this chapter.

Your safety is our highest priority. Please follow the usage and maintenance guidance in this chapter. Please note that in all circumstances, your safety is the highest priority.

Hint: Please do not allow unsupervised access to iPal for children under 3 years old or pets.

9.1. Security

Please press emergency stop button (lower button at iPal's back) under conditions below:

- iPal is in danger, such as if it comes into contact with water.
- iPal is going to harm surroundings.
- iPal is in behaving abnormally.
- Any other activities which may cause harm or is dangerous to people.

9.2. Usage

- Please do not use iPal when surrounding temperature is out of the 5°C ~ 35°C range.
- Do not charge, use or store iPal near fire or heaters, or in direct exposure to the sun.
- Do not disassembly or try to re-assembly iPal.
- iPal is for indoor use.
- Do not allow iPal to come in contact with water, or handle with wet hands.
- Do not use iPal around fire.
- To charge only use iPal's build-in charger.
- Do not set barriers within iPal's detectable area.
- Do not cover iPal sensors.
- Do not stay too close to iPal, as it will restrict the activity of iPal or cause unwanted interactions.
- Do not insert anything into iPal's chassis or gaps on head.
- Do not touch internal battery.
- Do not touch or move iPal's joints as below, it may cause damage on joints or pinched.

Shoulder Joint / Motor

Head Joint / Motor

Elbow Joint / Motor

9.3. Storage

- Make sure iPal is turned off.
- Store iPal in dry place without dust and in temperature range 0 ~ 45°C.
- It is advisable to recharge iPal periodically if it is not used for a long time.

10. FCC Warning

10.1. FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the

limits for a Class B digital device, 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.

10.2. RF Exposure Statement

To maintain compliance with FCC's RF Exposure guidelines, this equipment should be installed and operated with minimum distance between 20cm the radiator your body

Appendix

Ⅰ: iPal Specification

Item	Description	
Shape	Height x Length x Width: 1025 x 395 x 440 (Unit: mm)	
Weight	12.5kg (including battery)	
Battery	Capacity	6600mAh
	Voltage	18~21V
Working	Temperature	5℃ ~ 35℃
	Humidity	20% ~ 80%
Storage	Temperature	-20℃ ~ 60℃
	Humidity	30 ~ 90%
Control	Voice	Supported
	Keyboard	Supported
	Touch Panel	Supported
Color	4 colors (Blue, Green, Pink, Gold)	
Material	Body(White) / Back Buttons: ABS-PC + Paint / UVcoating	
	Body(Grey): ABS-PC + Paint / UVcoating	
	Chassis: ABS-PC + Paint / UVcoating	

Ⅱ: Charger Specification

Item	Description
Input Voltage	AC100V- 240V
Input Voltage Frequency	47-63Hz
Output Voltage	24V
Output Current	3.75A
Output Power	90W
Idle Power	<0.8W
Efficiency	>85%
Overload Current	>10A
Overload Voltage	>25V
Short Circuit Protection	No smoke, fire or change on shape
Input Wire	150 cm
Input Socket	US 120V 3 pins
Output Wire Spec	AWG16
Output Wire Length	120 cm
Output DC	5.5x2.5 mm round
Temperature	0℃-40℃
Humidity	5—95%
Average Lifetime	20000h
Material	Inflame retardant ABS
Pack Size	58*139*31 mm
Appearance	Black
Max Current	4A

Ⅲ: Others

Announcements:

Please use this product only under supervision by an adult. Do not use this product outdoor or unsafe places.

iPal should be periodically examined to make sure that everything is operating correctly.

Any attempt to disassemble is unsafe and will void the warranty.

Do not allow children to play with damaged product.

Do not expose this product to high temperatures, humid environments or directly to the sunlight.

This product should not be cleaned by water. If product is dirty, please wipe off with a dry towel. Do not use diluent or benzene liquid on this product.

Regarding the battery:

1. iPal contains a lithium battery.
2. Power supply cannot be short circuited.
3. Charging must be operated by adult.
4. Do not take battery out of this product when charging.
5. Battery should be removed from this product if it is not used for a long time. Power supply should be cut when this product is shutdown.
6. It is a must to periodically check the charger. If damage is found, stop using immediately until it is repaired.

iPal should not be used by children under 3 years old. Old batteries should be dropped in professional recycle bin.

AVATARMIND
阿 凡 达 机 器 人