MAESTROGEN

iTrack® Pipette Tracking System

Cat. No.: TK-01

Instruction Manual

Version 1_14

Table of Contents

Table of Figures

About iTrack

iTrack, a proprietary[1] pipette tracking system, is a tablet powered smart lab device that can detect, guide, and record manual pipetting. It helps users avoid pipetting errors and keep a detailed record of each pipetting step for troubleshooting and quality control.

iTrack uses two layers of sensors to detect the locations of pipette tips. The lower layer is for 384-well plates, whereas, the upper layer is for 96-well plates and strip tubes.
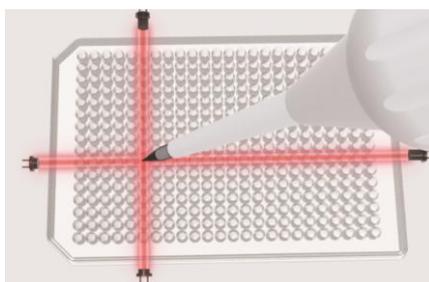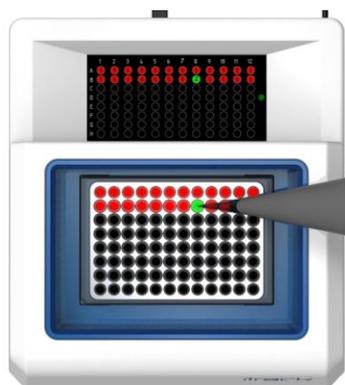

Figure 1. Pipette detection
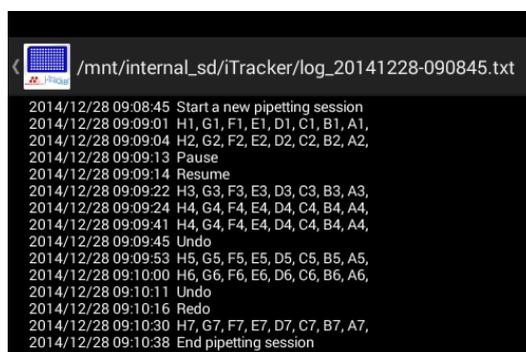

Figure 2. Illumination of pipetted location

Figure 3. Log file records every step

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[1] Patent pending

Technical Support

Maestrogen provides technical support for all of its products. If you have any questions about the product use or operation, please contact Maestrogen:

8275 South Eastern, Avenue #200

Las Vegas, NV 89123

USA

E-Mail: info@maestrogen.com

Warranty

iTrack is warranted against defects in materials and workmanship for 1 year after the purchase. If any defects occur in the instrument or accessories during this warranty period, Maestrogen will repair or replace the defective parts at its discretion without charge. The following defects, however, are specifically excluded:

1. Damages caused by improper operation, misuse, accident, or disaster
2. Repair, modification, or part substitution performed by anyone other than Maestrogen or its authorized agent.
3. Use of fittings or spare parts supplied by anyone other than Maestrogen.
4. Corrosion caused by solvent or samples.

For any inquiry or request for repair service, contact your local Maestrogen office. Inform Maestrogen of the model and serial number of your instrument.

Regulatory Notice

IMPORTANT: The iTrack instrument is designed and certified to meet safety standards and EMC regulations. Certified products are safe to use when operated in accordance with the instruction manual. This instrument should not be modified or altered in any way. Alteration of this instrument will:

1. Void the manufacturer's warranty
2. Void the safety and EMC certification
3. Create a potential safety hazard

Maestrogen is not responsible for any injury or damage caused by the use of this instrument for purposes other than those for which it is intended, or by modifications of the instrument not performed by Maestrogen or an authorized agent.

Product Specifications

Items	Specifications
Compatible Pipette	Single-, 8-, & 12-channel (fixed space)
Compatible Tip	0.1 - 1,000 µL
Compatible Microplate / Tube (PCR, ELISA, storage…)	96-Well Microplate (height < 23.5 mm)
	384-Well Microplate (height < 11 mm)
	8-tube / 12-tube strips
Control System	Android Tablet
CPU & RAM	Quad-Core A9 1.6GHZ, 1G DDR3 RAM
Storage	8 GB NAD Flash, MicroSD supports 64GB
Ports	MicroSD, MicroUSB, power, headset
Display	8" Capacitive Touch Screen, 1,024 x 768 pixel
Cameras	Front / 2MP Back
Operation Voltage	100-240V / 0.3A (Tablet)
Operation Power Consumption	5V / 0.5A
Battery	3.7V – 3500mAh
Scan Light Source	IR Light-Emitting Diode
Scan Frequency	200 - 500 Hz
Detection Time	0.5 - 3 sec.
Size	255mm x 230mm x 54mm (10" x 9" x 2")
Weight	1.9 Kg (4.1 lb)

Setup

1. Carefully unpack the iTrack instrument.
2. Place the instrument on a stable, horizontal surface without vibrating devices such as centrifuges or ice makers around.
3. Turn on the tablet: Press and hold the power button for 3 - 5 seconds.
4. Set up clock, network connection and others as needed from the tablet.
5. Connect the tablet to the base using the Micro-USB OTG adapter (Figure 5).
6. Avoid direct sunlight, fire, infrared light, and blinking lights nearby to prevent interference.
7. The instrument uses infrared LED to detect pipetting locations. The slits that house sensors layer should be kept clean and clear.
8. The screen is protected by a film. It can be operated with or without the film.
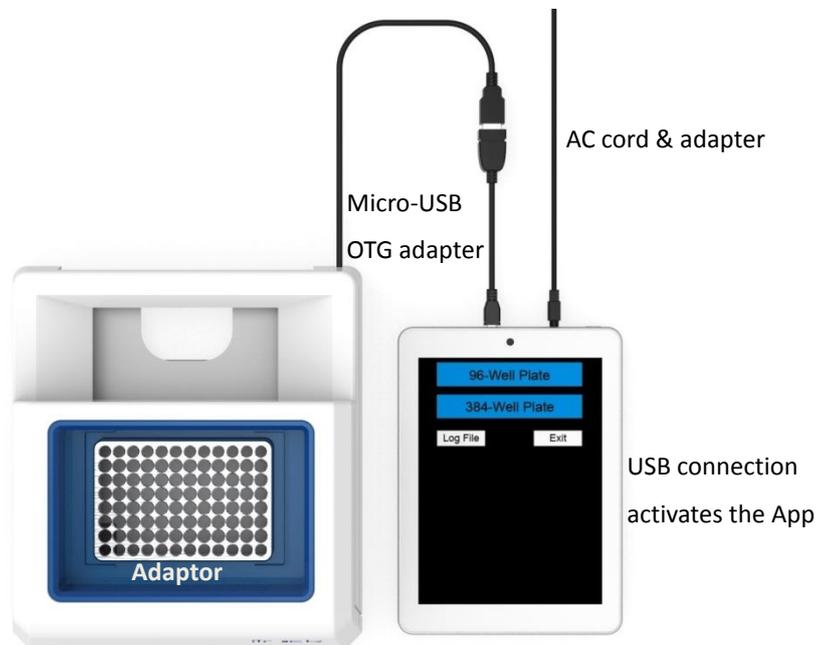
What's included

Figure 4. iTrack components

Connection
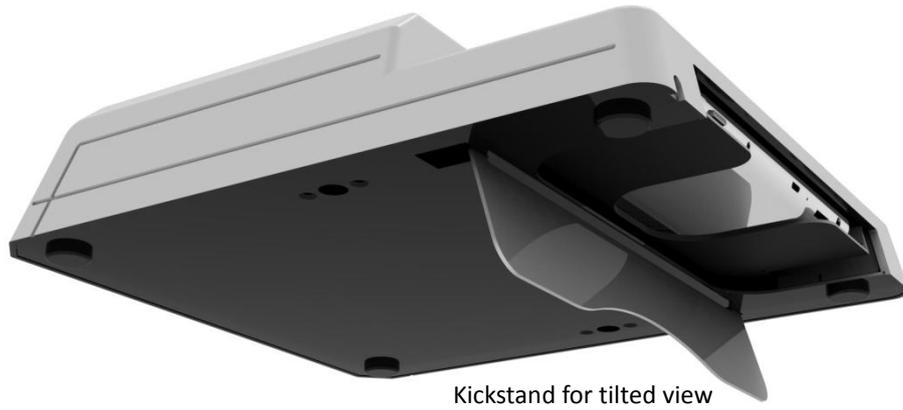

Figure 5. Connect iTrack

Kickstand

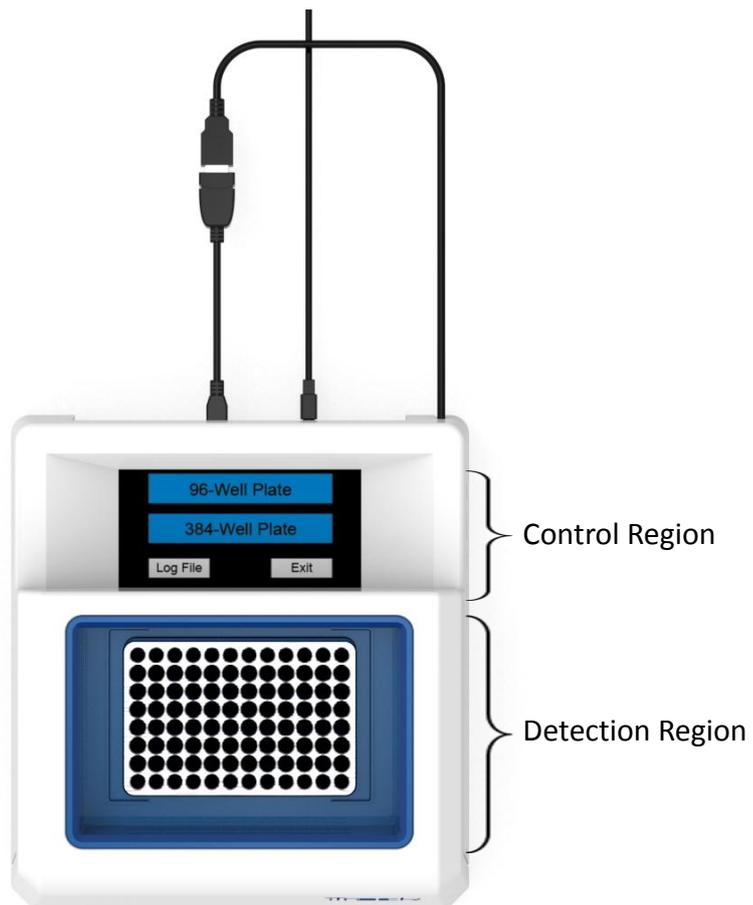Kickstand for tilted view

Figure 6. Bottom view with kickstand

Assembly

96-Well Plate

384-Well Plate

Log File   Exit

Control Region

Detection Region

Figure 7. iTack assembly

Microplate Adapter Selection
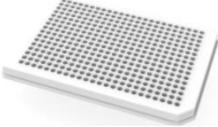
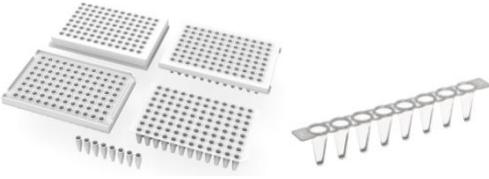| Plate Type	Adapter
384-well (full-skirt) plate	No adapter is needed
96-well PCR plate & Low-profile tube strips	adapter A
96-well ELISA or storage plate	adapter B
Full height (high profile) tube strips	adapter C (not included)

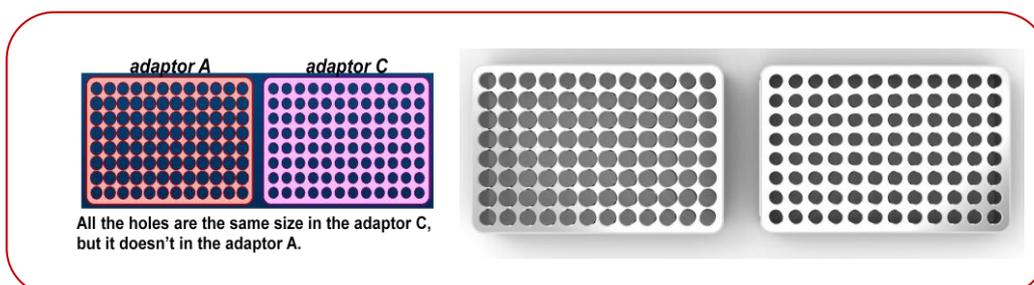**Figure 8. Adapter A and C heights**

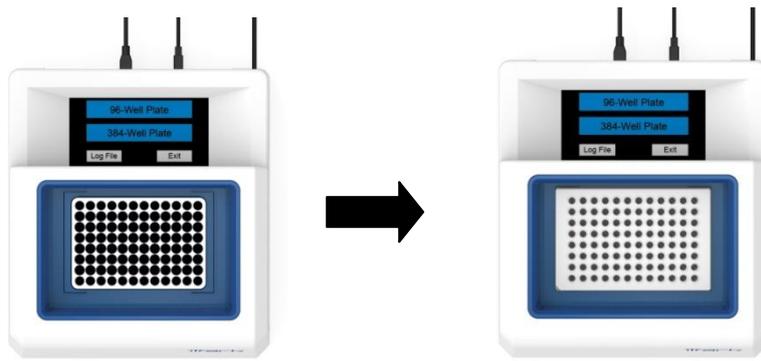**Figure 9. Adapter A and C hole sizes**

Figure 10. Place a 96-Well Plate on Adapter A
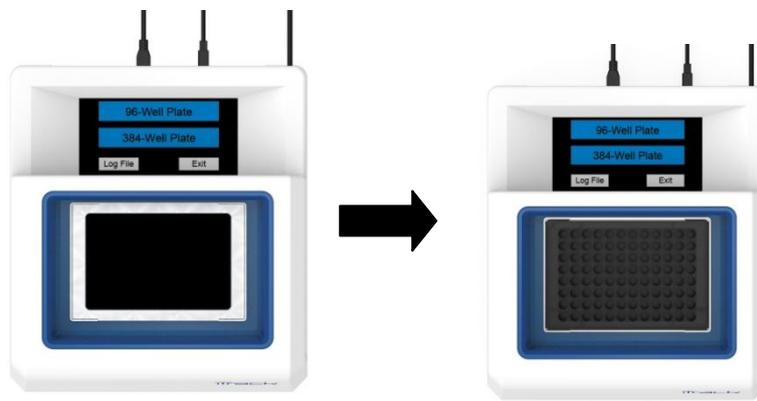
Figure 11. Place a 96-well ELISA or storage plate on adaptor B
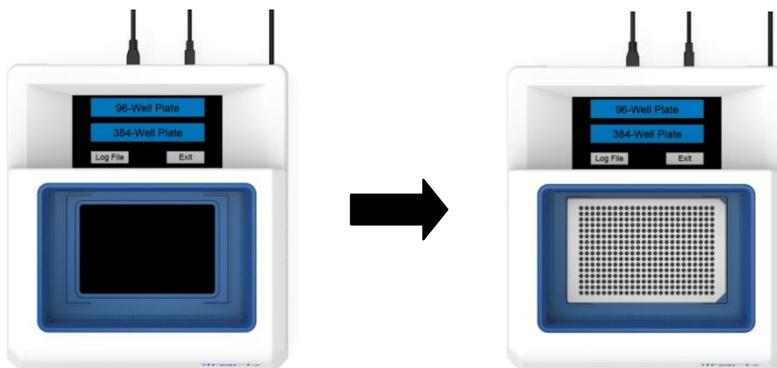
Figure 12. Place a 384-well plate directly in the Detection Region

The purpose of the adapters is to secure microplates and tubes to the correct location and adjust their heights so that they sit just below the detection layers.

It is important to make sure the top surface of the plate or tube does not obstruct the scanning layer. The upper scanning layer should be clear of any object other than the pipette during a 96-well detection session. The lower scanning layer

should be clear of any object other than the pipette during a 384-well detection session.

Figure 13. Upper scanning layer for 96-well plates

Figure 14. Lower scanning layer for 384-well plates

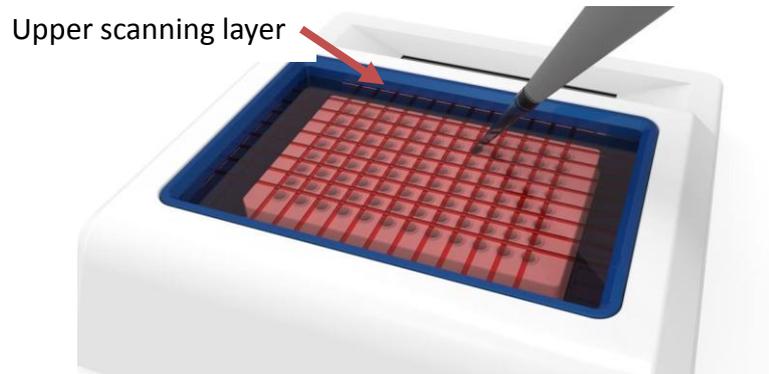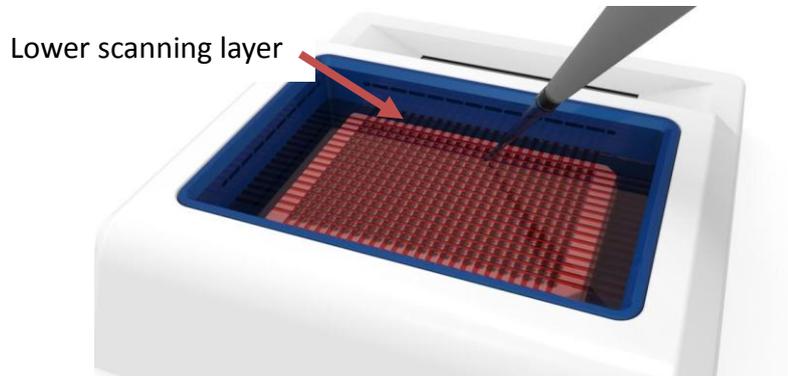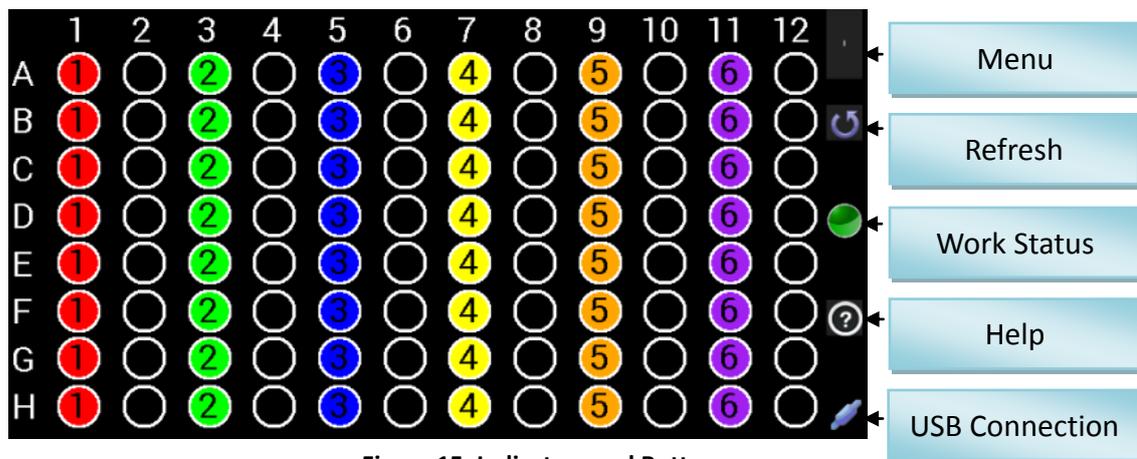# Buttons and Indicators

Figure 15. Indicators and Buttons

1. Menu

Touch the Menu Button (method b) at upper right corner will bring up the menu. The menu can also be brought up by swiping from left side of the screen to the right (method a).
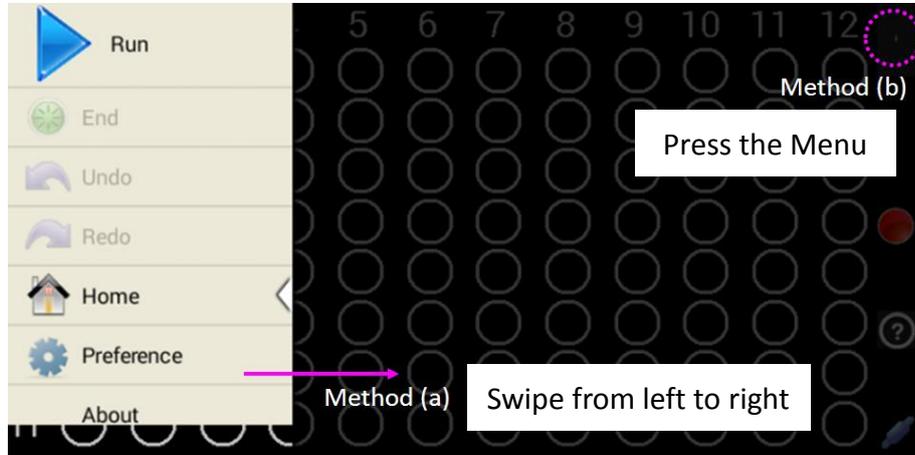

Figure 16. Open the Menu

- o **Run**: Start a new pipetting detection session, or resume a paused detection session. Please make sure the scanning layer is free of any object (including pipette) when clicking the "Run" button.
- o **Pause**: Pause detection of the current session. "Pause" shows up at the "Run" button location when the session is active.
- o **End**: End the current detection session.
- o **Undo**: Erase the signal (light and number) generated from last pipetting step, as if it didn't happen. However, the log file still records the last step, as well as the Undo action.
- o **Redo**: Restore the signal erased by Undo.
- o **Home**: Return to the Home Page. It will end the current session if it has not been terminated.
- o **Preference**:
  - Choose the type of pipette being used: Single-, 8-, or 12-channel
  - Adjust the detection sensitivity if needed. The default is optimal for most users and usually do not need to be adjusted. Lower sensitivity improves reliability of the detection.
  - The "Auto Save Log file" is checked by default. Each pipetting step will be saved in a log file automatically. If this feature is not desirable, uncheck the box.
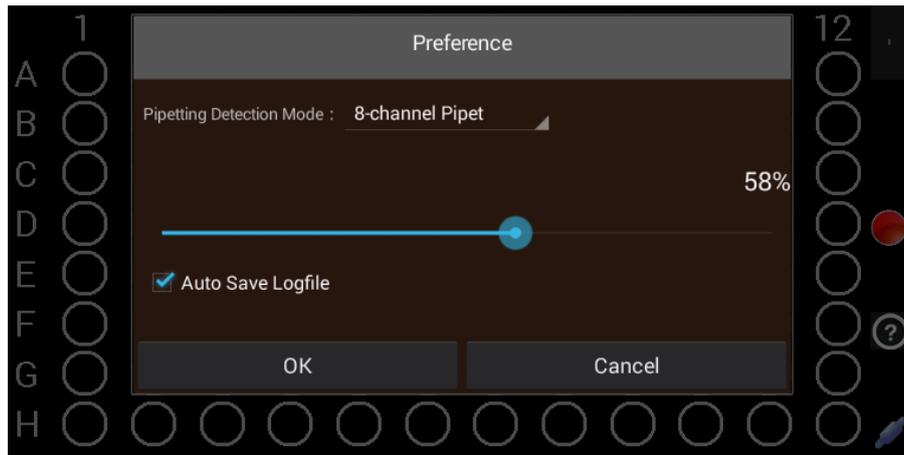
Figure 17. Preference

- o **About**: Check software & firmware update (see "Software Update").

2. Refresh

Detection may stop if the microplate is moved during pipetting. If iTrack fails to detect pipetting after repeated attempts, press the Refresh button ⟳ to resume the detection.

3. Work Status

- o Red: The detection is inactive. No pipetting will be detected.
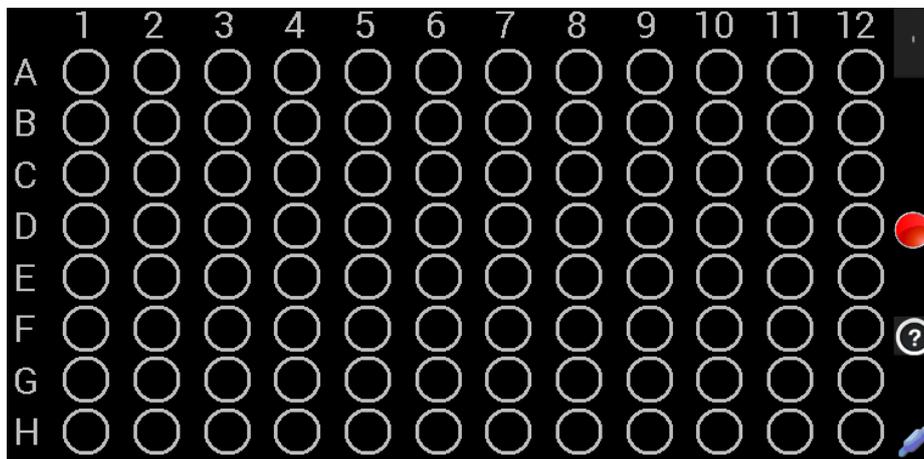- o Green: The detection is active.

Figure 18. Red light indicates the detection is inactive

4. Help

Press Help button will open the latest iTrack manual if it is already downloaded to the tablet. A PDF Reader is needed to read the manual. The free PDF Reader can be installed from Google Play store.

If the latest iTrack manual is not downloaded to the tablet, pressing Help will start the downloading process.

5. USB connection

The indicator shows the tablet is connected to the base (via USB).
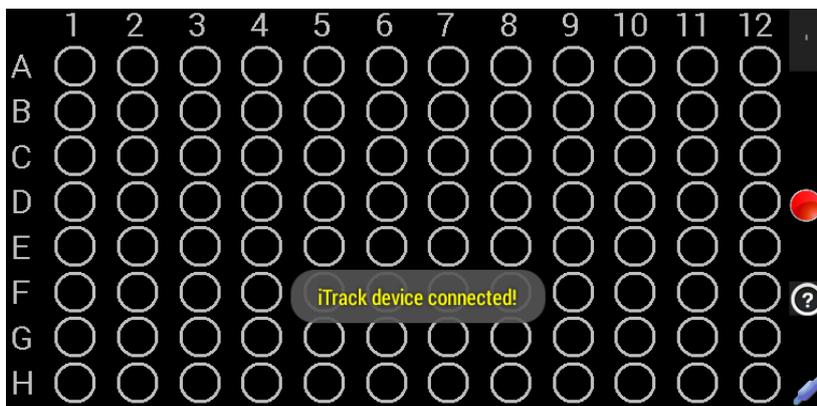

Figure 19. USB Connected

The indicator shows the tablet is not connected to the base.
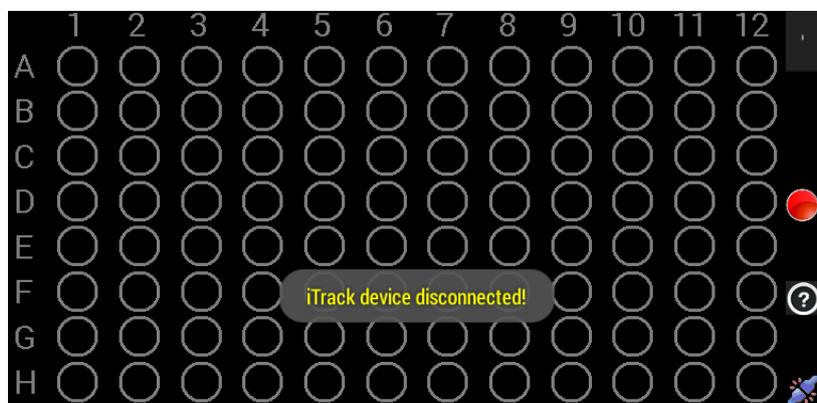

Figure 20. USB Disconnected

Operation Instruction

iTrack can be operated with the tablet's battery or plug-in power with included AC adapter. The AC adapter supplies 5V DC.

Avoid direct sunlight, fire, infrared light, and blinking lights nearby to prevent interference.

1. Turn on the tablet

   Press and hold the power button for 3 - 5 seconds.

2. Open the iTrack app

   Connect the base with the tablet through the attached USB cable and the micro-USB OTG adapter (Figure 4 & 6). After connecting, the tablet will start iTrack app automatically. The iTrack app can also be started manually from the tablet.
   To save energy, the Wi-Fi will be turned off automatically by the iTrack app.

3. Place the microplate

   Place the microplate or tube strips in the detection area with the appropriate adapter (see "Microplate Adapter Selection") if needed. Make sure the top surface of the plate / tube does not block the detection layer.

4. Select plate type

   Press "96-Well Plate" or "384-Well Plate" from the Home page. Choose "96-Well Plate" when using strip tubes.
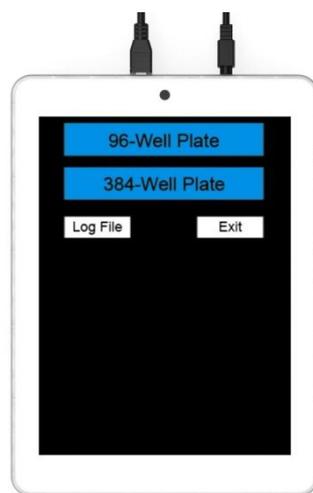

Figure 21. Home page

5. Open the menu

   Use one of the two methods (see Figure 15):
   (a) Swipe from left side of the screen to the right.
   (b) Click the menu button at upper right corner of the screen.

6. Click ''Run'' button

   The "Run" button can be used to start a new session, and resume or paused a current session. (The "Run" button cannot be clicked if the tablet is not

connected to the base via USB.)

7. Select the pipette type

Preference screen will pop up - Select the pipette type and press OK to start the pipetting session (Figure 16).

8. Start pipetting

    o After each pipetting step (after the pipette tip leaves the well), the detected pipetting location will be shown in light on the tablet screen, both underneath the well in the detection area and in the control area. The last pipetting location is shown in continuous flash light.

    o If the same well is pipetted multiple times, it will show a different color and the number of times it is pipetted.

    o It's preferred to perform the next pipetting step after the tablet shows the previous pipetting location.

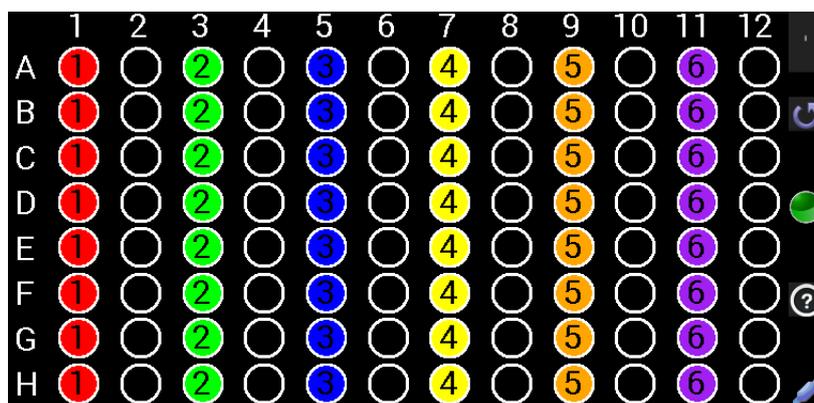   o Make sure the pipette tip only moves up-and-down when pipetting.

Figure 22. The number indicates how many times the well is pipetted

9. End the pipetting session

Click "End" button to terminate the pipetting session. A confirmation window will pop up to confirm. A text log file will be saved automatically if the "Auto Save Log file" option is checked in the Preference. The log file records every pipetting step (pipetting location and time).
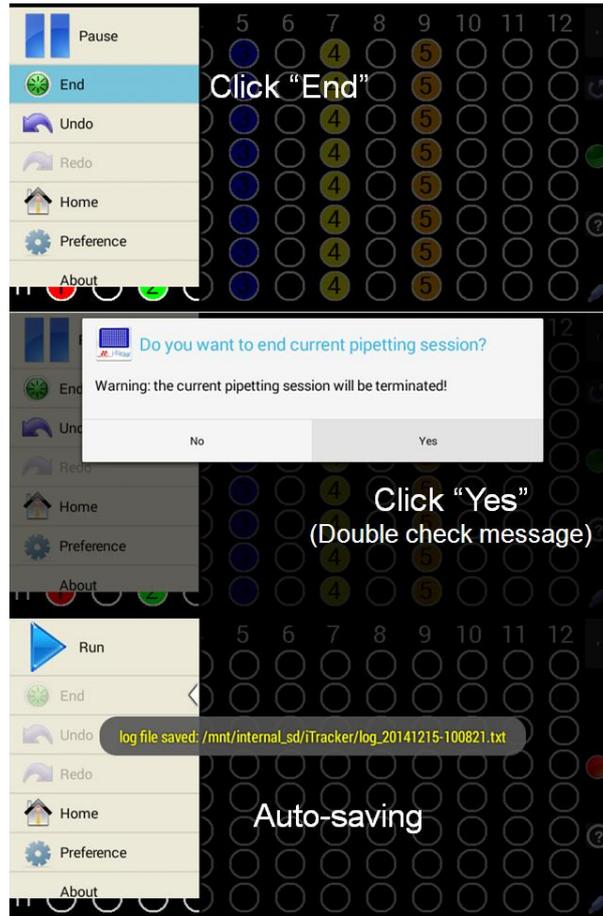
Figure 23. End the pipetting session

10. Change the plate type

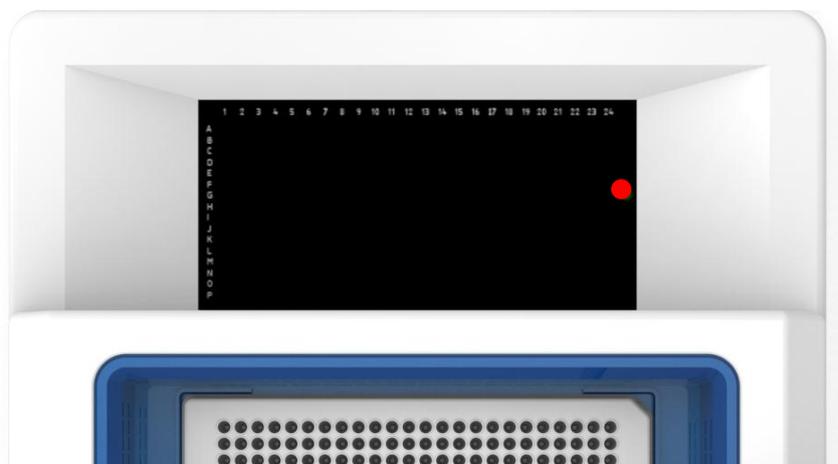   Click "Home" to return to the Home page and select a different plate type.

Figure 24. 384-Well plate user interface

Log File

On the Home page, click "Log File" to display the pipetting records.
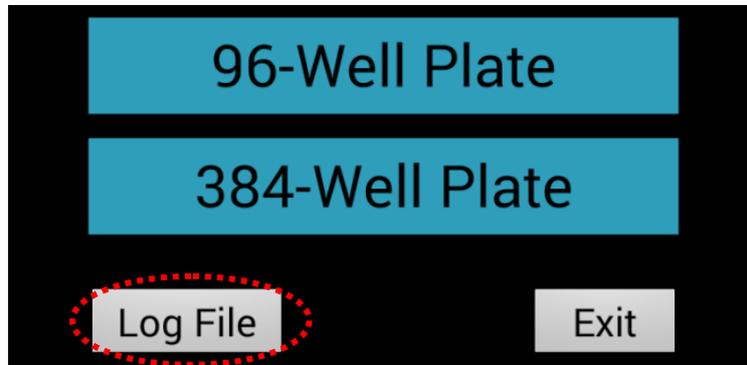

Figure 25. Log File

Click specific log files to show the options to open, delete, or rename the log files.
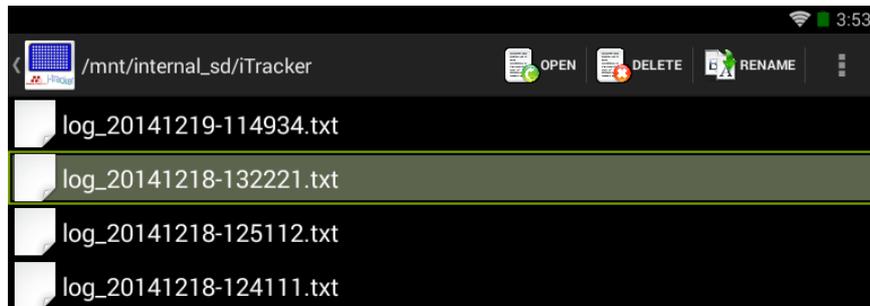

Figure 26. Log file list

Each log file includes the time and location of every pipetting step in text format.
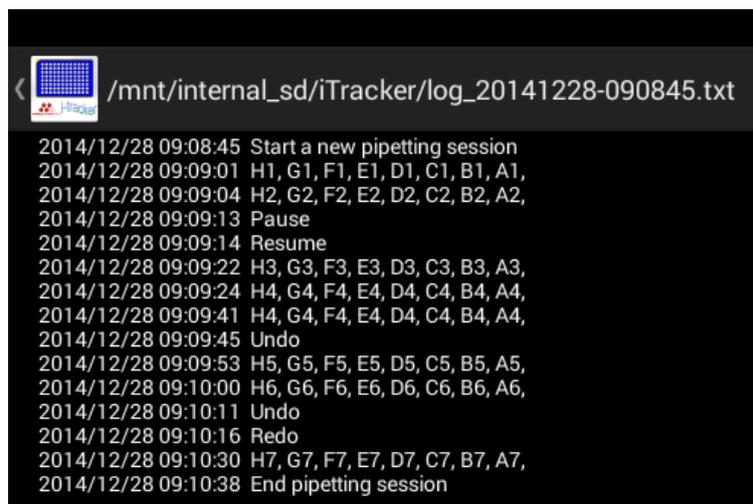
Click icon to go back.

Figure 27. Log file content

Software Update

For best performance, please keep the software and firmware up to date. Following the steps below to check and update:

Step 1 – Click "About" button at either 96-well or 384-well interface. The system will connect to the Internet automatically if Wi-Fi is set up.
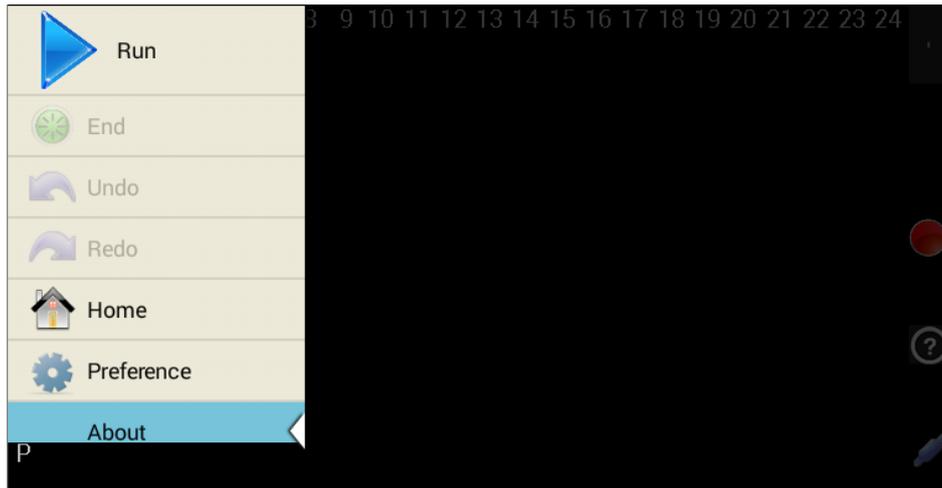

Figure 28. Menu - About

Step 2 – Click "Upgrade" if the Firmware or App is "out-of-date" after checking.
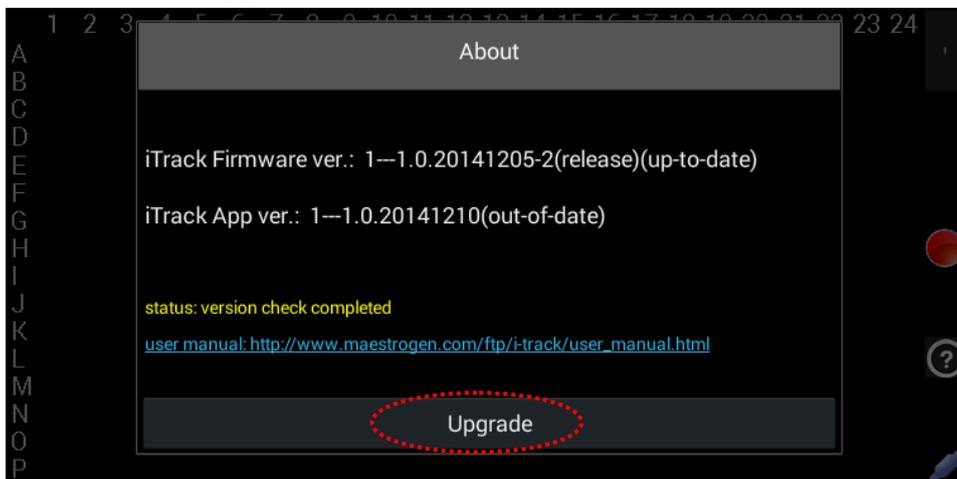

Figure 29. Software update

The URL of the user manual is also listed in the About screen.

Troubleshooting

If the following problems are encountered, please refer to the following suggestions for troubleshooting. For further assistance, please contact your local customer services.

1. iTrack does not work after connecting the tablet via the USB cable.

   (a) Re-connect the USB cable.

   (b) Re-start the iTrack app.

   (c) Reboot the Tablet.

   (d) Check if the USB cable is damaged.

   (e) Check if the USB port of tablet is damaged.

2. iTrack shows the LED and sensor failure indicator ✖ , the sensor failure indicator)(((, or the LED failure indicator 🔒
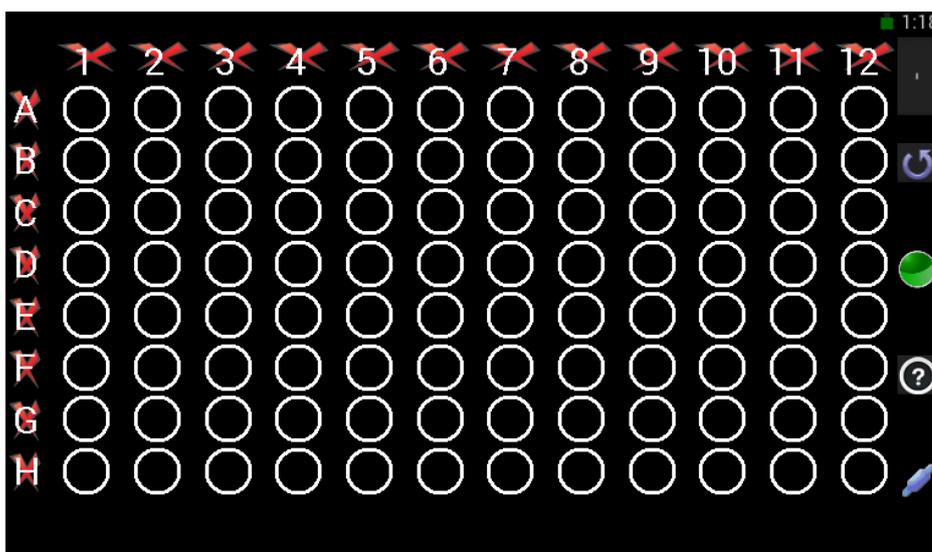

Figure 30. LED & Sensor error

   (a) The microplate or tubes may be sitting too high, blocking the sensing signal. Please choose an appropriate adapter to make sure the top surface of the microplate or tubes is below the scanning layer.

   (b) Re-start the iTrack app. before pressing "Run" to start the pipetting session, please make sure the scanning layer is free of any object.

   (c) Press 🔄 to refresh the detection.

3. High error rate of detection

   (a) If encountered two or more errors consecutively, press 🔄 to refresh the

detection. Avoid moving the microplate or tubes during the session.

(b) Make sure the scanning layer is not blocked by any object when the "Run" button is pressed. Keep the scanning layer free of any object other than the pipette tips during the session.

(c) Try the different sensitivity setting.

(d) Check if the well adaptor is at the right position.

(e) Re-plug or change a new Micro-USB OTG adaptor.

(f) Clear iTrack app cache in the tablet setting.