Feibot A400 Active Reader User Manual

1. Introduction

The Feibot A400 active reader is a high-performance device designed for precision and ease of use in various high-speed sporting events. Featuring a touchscreen interface, it operates with a low-frequency wake-up and high-frequency reception system. While the chip pass over the loop, it's activated by the loop, then the chip data info is sent through the high frequency antenna to the reader. This highly integrated device boasts excellent reading performance and low power consumption.

Features:

1. Integrated with 4 high-performance high-frequency receiver modules with stable performance and extended transmission range.
2. Features two low frequency loop connectors, can be used separately or simultaneously.
3. Built-in large-capacity lithium battery, providing over 10 hours of continuous usage and up to 40 hours of standby time.
4. Encased in rugged and durable Pelican case。
5. User friendly touchscreen interface with all information visible at a glance.
6. Adjustable power settings for optimal performance and energy efficiency.

2. Accessories

1) Low-frequency loop: The loop is placed on the track for the athletes/bikes/carts to pass over on it. It activates the active tags, the tags then send signals to the active reader trough the high-frequency antennas on reader. Can place the loop in two ways: 1. Tape the loop on the ground. 2. Dig up and burry the loop under ground, about 10~20CM deep. Can make the loop width 10~80CM, usually the wider the loop, the wider/higher detection range, but the accuracy also drops. Can test to find what's the ideal width for specific race.

2) High-frequency antenna: As a supplement to the machine's built-in 2.4GHz antenna, the omnidirectional high-gain 2.4GHz antenna enhances the data reception and transmission. This antenna can be directly mounted onto the reader or connected via an extension cable, which is

recommended when using with extended loop length or in crowded environments.

3) High-frequency antenna extension cable: To Connect the high-frequency antenna to the active reader.

4) Low-frequency loop extension cable: To connect the low-frequency loop junction box to the reader.

5) Low-frequency loop junction box: To connect the low-frequency extension cable to the low-frequency loop.

3. Reader panel

3.1 Touch Screen

3.2 Type-C Charging Port

3.3 Charging Port

3.4 Power

3.5 High Frequency Antenna Port

3.6 Beeper

3.7 Fan

3.8 2.4 G Antenna

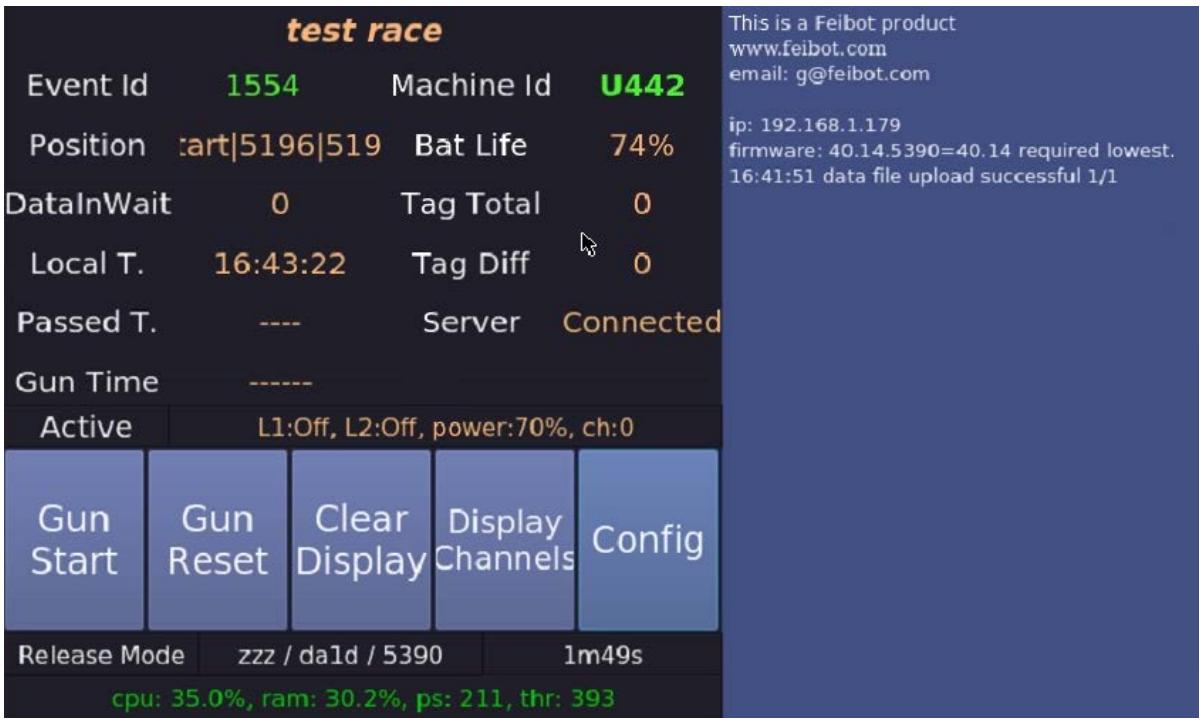
3.9 Wireless Antenna

3.10 Low Frequency Loop Port

4. Screen menu

The A400 active reader features an interactive screen that provides a comprehensive overview of the reader's status, including internet connectivity and tag data information etc. Through this intuitive interface, users can perform a variety of operations seamlessly, such as event config info downloads, loop power setting, channel setting etc.

4.1 Main Interface



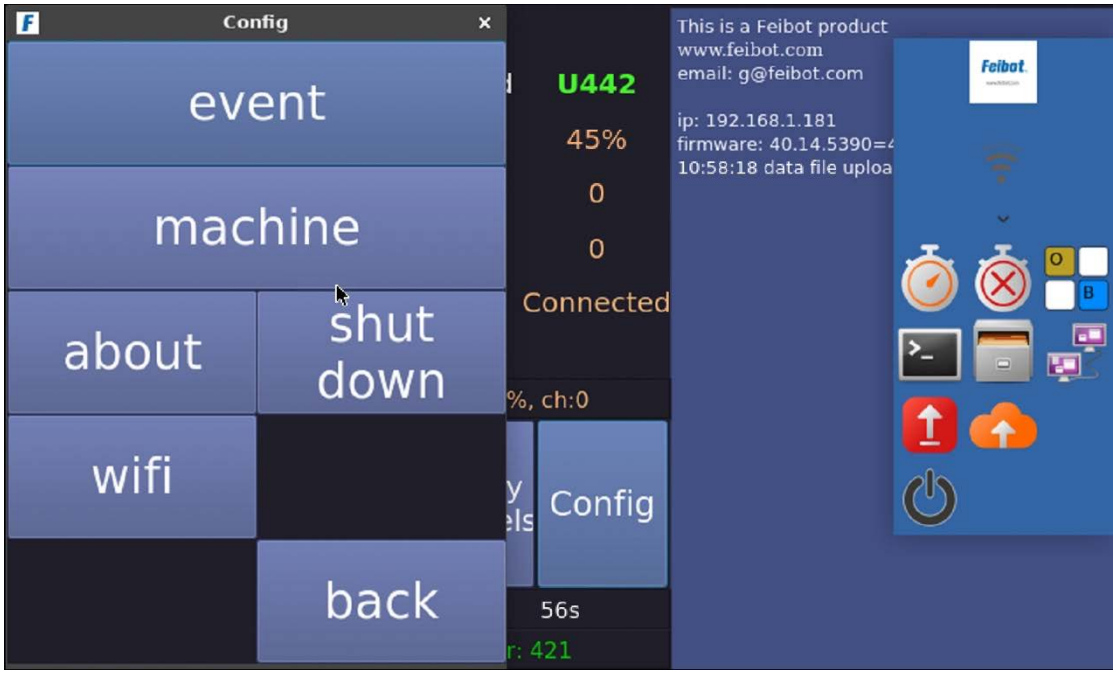
1) Race name on the top, Once the event configuration file is downloaded from the Feibot cloud, it will display the race name on top of reader screen
2) Event Id: Once the event configuration file is downloaded from the Feibot cloud, the screen will display the Event ID, indicating the specific event that the device is currently associated with.
3) Position: The position information configured for the device from Feibot cloud software website.
4) Data In Wait: The total amount of data that has been read by the device but not yet uploaded to the Feibot server. If it's zero, it means all data uploaded to server. If it says 100, it means 100 tag data info is waiting to be uploaded to server. Can try to switch internet connection, wait until the pending data count is zero before turning it off.
5) Local T.: The current time (HH:MM:SS) of the device. Make sure to check the reader date and time before race, sync the readers' time if there are multiple readers.
6) Passed T.: How much time has passed since the gun start
7) Gun Time: It will record the current time when press the gun start button, usually press it when the race starts
8) Machine Id: The serial number of the device.

9) Bat Life: The current battery level of the device.
10) Tag Total: The total number of tag data info detects by the device. Eg one tag detected N times, it will say N here.
11) Tag Diff: The number of unique tags count
12) Server: Displays the current network and server connection status, connected means connected to server. No means, not connected to server, but there is internet connection
13) Active: Displays the on/off status of low-frequency port 1&2, the activating power and the high frequency channel
14) Gun Start: Click to gun start to record the time when the race officially starts
15) Gun Reset: Click to clear the Gun Start setting
16) Clear Display: Click to clear all info displayed on the right side of the screen, also clear tag number info on the screen. This will not affect the tag recorded in local file or uploaded
17) Display Channel: a shortcut to enter the active setting page
18) Config: Click to open the config page.
19) Release Mode: Displays the current mode of the device, with two options: "Normal Mode" and "Test Mode."
20) Zzz/da1d/5390: The current software/firmware version of the device, after upgrading the software or firmware, this info here will change

21) Uptime: Displays the duration for which the device has been powered on.

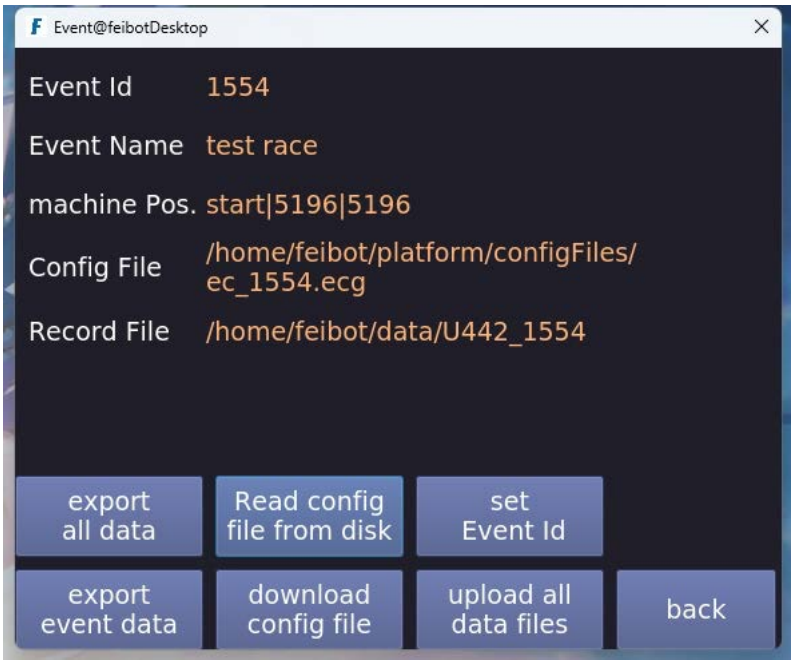
22) CPU and RAM Usage: Displays the CPU and RAM usage, as well as the number of running processes and threads on the current operating system.

4.2 Configuration Interface



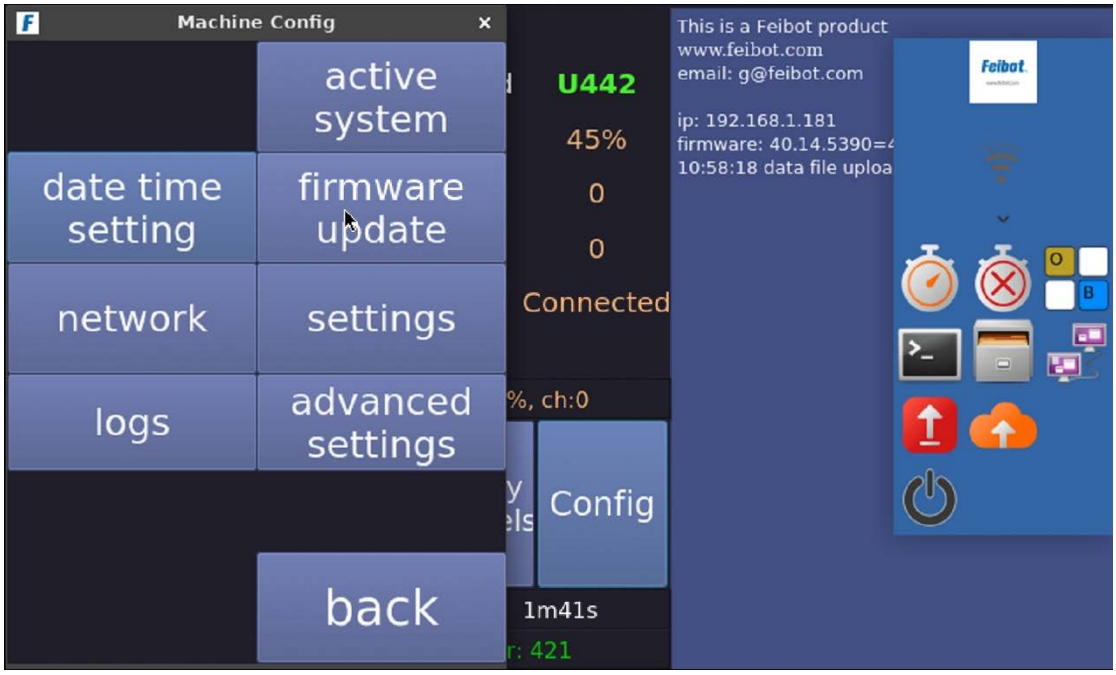
1) Event
2) Machine
3) About
4) Shutdown
5) WIFI

4.3 Event interface



1) Event Information: Displays the current event's info, eg race name, race ID, machine position, data file name
2) Export All Data: Click to export all data stored on this device into USB drive
3) Export Current Event Data: Click to export the data for current race into USB drive
4) Read Event Config File: It can download event config file (ecg file in special format) from USB drive
5) Download Event Config File: Click to download the pre-configured event info from Feibot cloud software. Edit the race info and download config file before the race starts.
6) Upload All Data Files: Upload all event data files read by this device to the server

4.4 Machine Interface



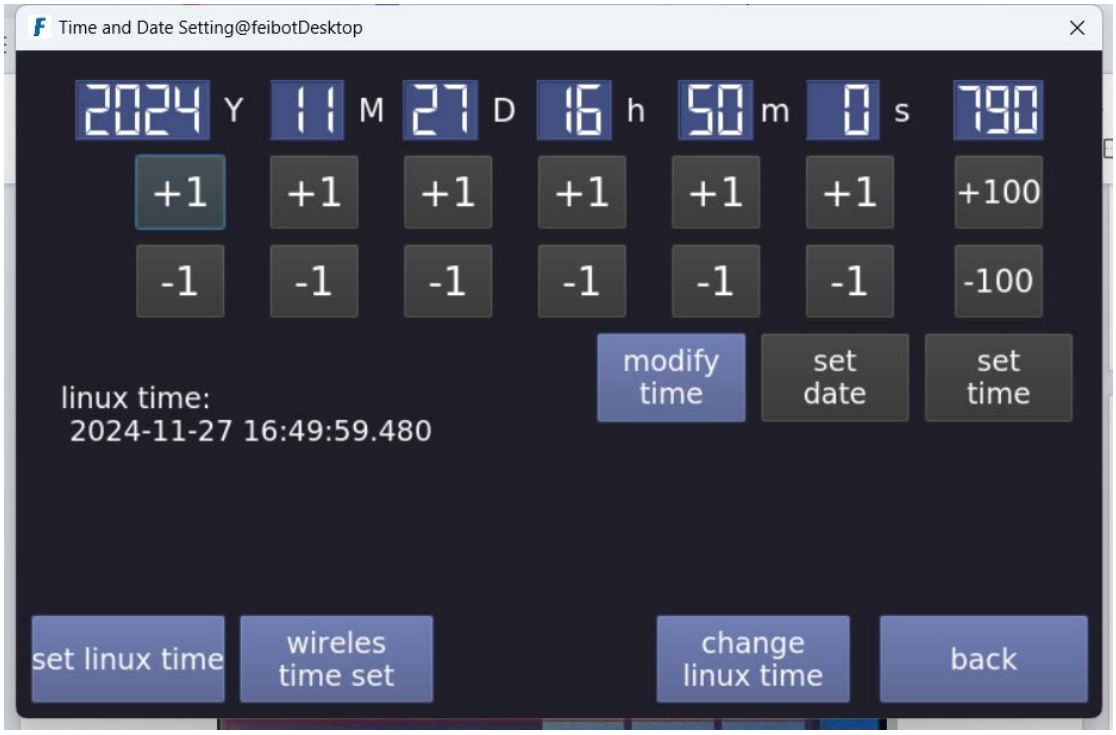
1) Active System
2) Date and Time Settings
3) Firmware Upgrade
4) Network Settings
5) Settings
6) Logs
7) Advanced Settings

4.5 Active System Interface

1) Active Loop 1 or loop 2: When click start, the status will change into ON (loop connected), or break (loop disconnected), when click stop, it's OFF
2) Activating Power: Click + or – to set the loop activating power, with a maximum of 100% and a minimum of 0%. The higher the power, the wider activation range
3) Activating Channel: Choose the high frequency channel from 0 to 5. The communication distance decreases from channel 0 to channel 5. Channel 0 can receive signal from chips activated by other nearby readers. If don't want to receive info from nearby readers, can set readers into different channel from 1~5.

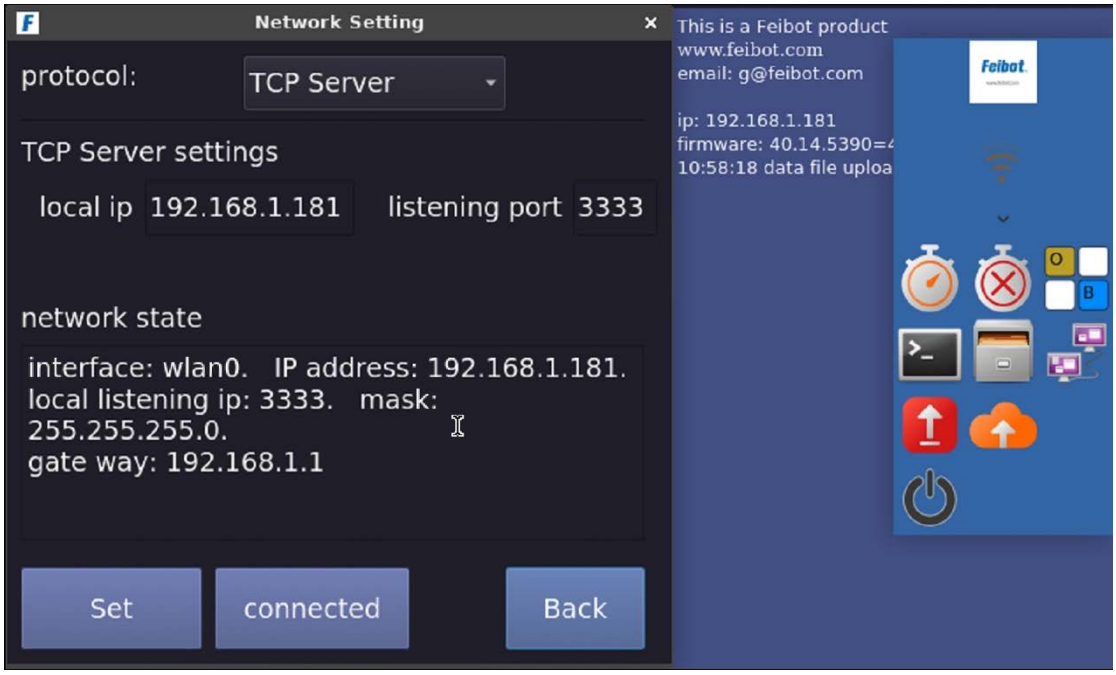
4) Restart Active Component: Restart the active module part

4.6 Date and Time Settings Interface



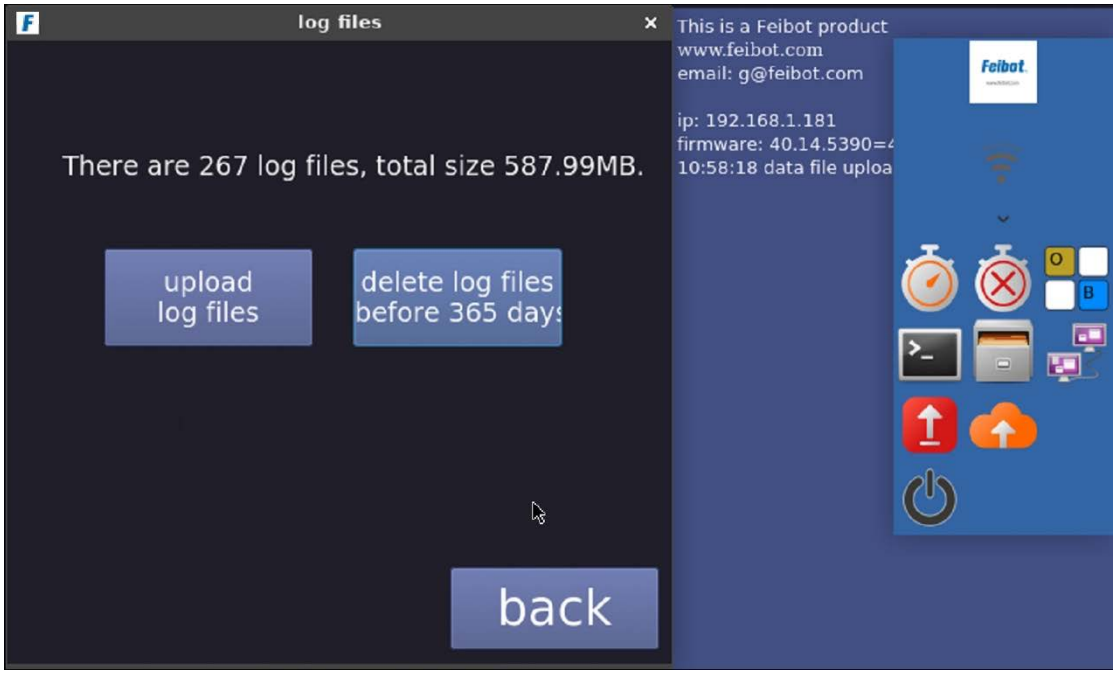
1) Modify Time: Click modify time, then adjust the time or date by clicking the "+1" or "-1" buttons, then click on set the time and date.
2) Set Linux time: Linux time will update automatically when reader is connected to internet, can click set linux time, then reader time will be same as linux time/current internet time
3) Wireless Time Set: Click to sync nearby devices to the current time of this device.
4) Change linux time: When there is no interenet, can set reader time, then make linux time the same as reader time.

4.7 Network Settings Interface



1) Network Protocol: Can choose between two network protocols, "UDP" or "TCP".
2) IP: Reader IP(automatic) when connected to internet
3) Port Number: Can edit and set port number
4) Click Set and connected to save the port setting.

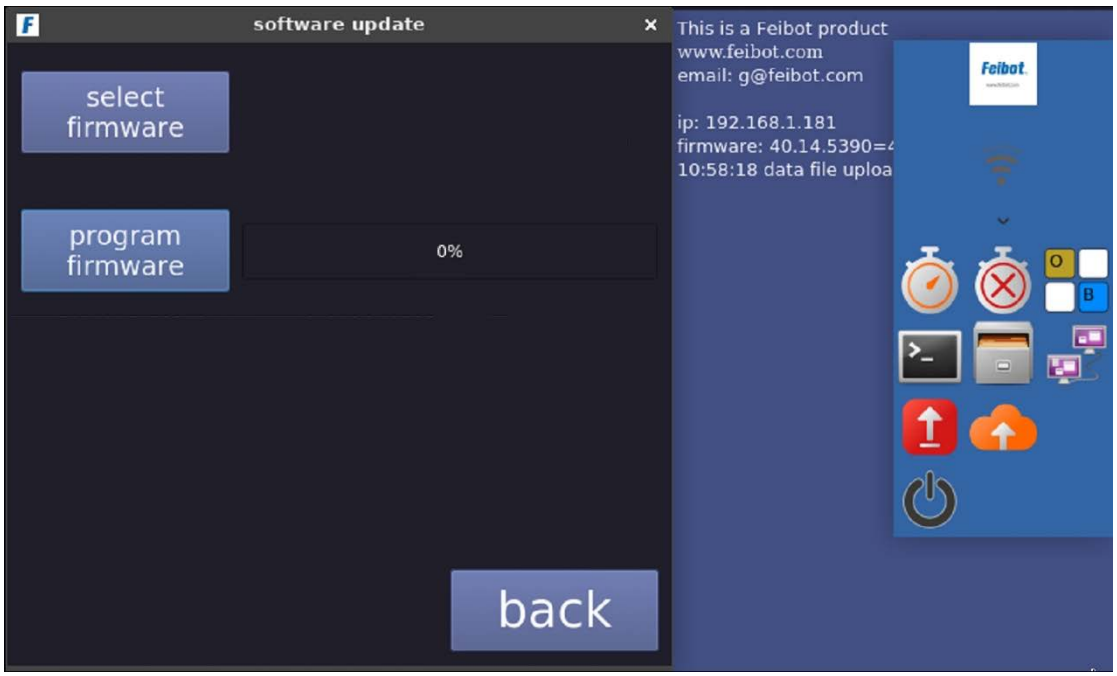
4.8 Log Interface



1) Upload All Log Files: Upload all log files from this device

2) Delete Log Files Older Than 365 Days: Delete log files that's from 1 year agao

4.9 Firmware Upgrade Interface

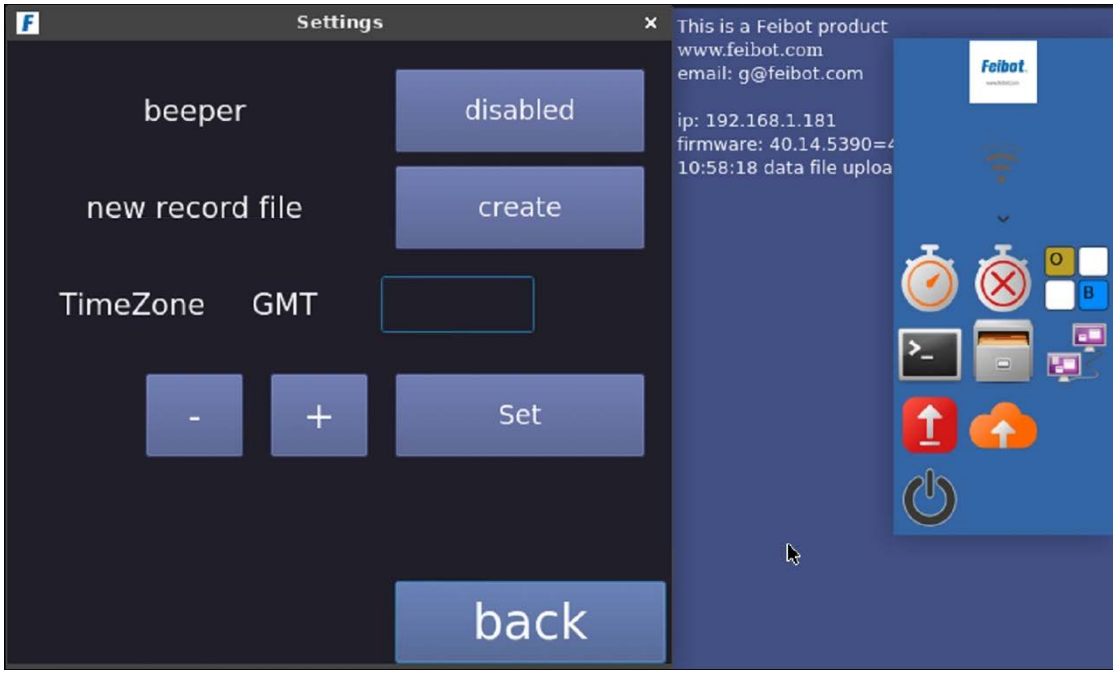


1) Select Firmware: Click to choose the firmware version you

want to upgrade.

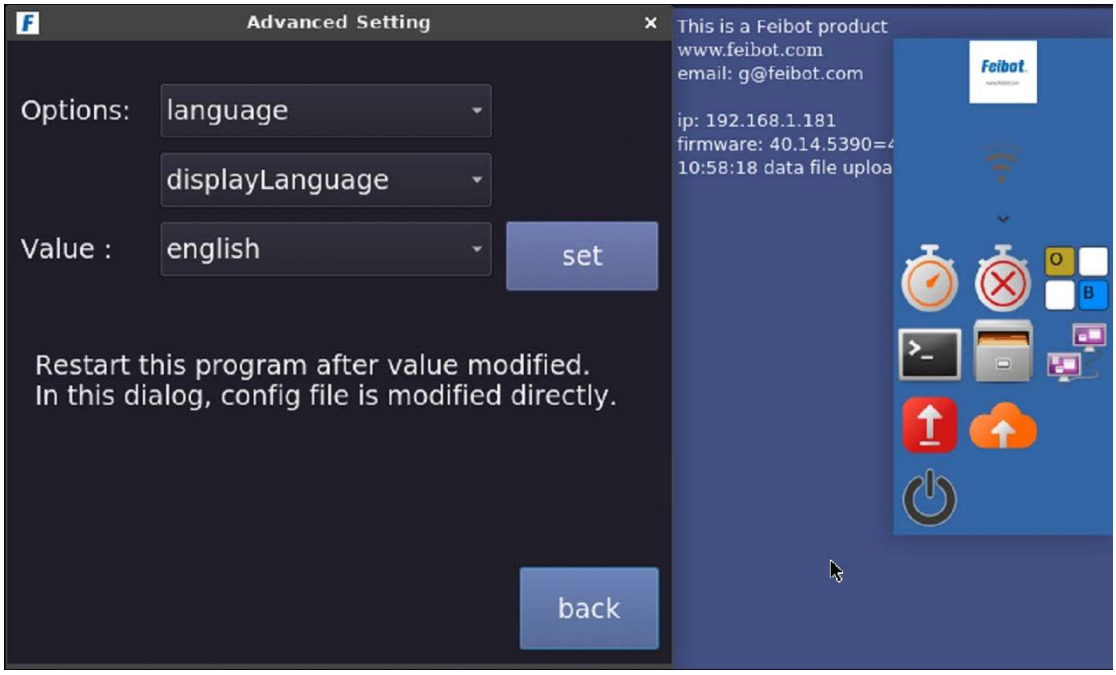
2) Program Firmware: After selecting the firmware to upgrade, click to start. Wait for the progress bar to reach 100% and then restart the software.

4.10 Settings Interface



1) Enable/Disenable Beeper: Activate or deactivate the beep sound
2) Create New Files: Create a new csv file in the data directory
3) Time zone Setting: click + or – to set time zone, eg +8 for China time. After change the time zone setting, the linux time will change into local time automatically.

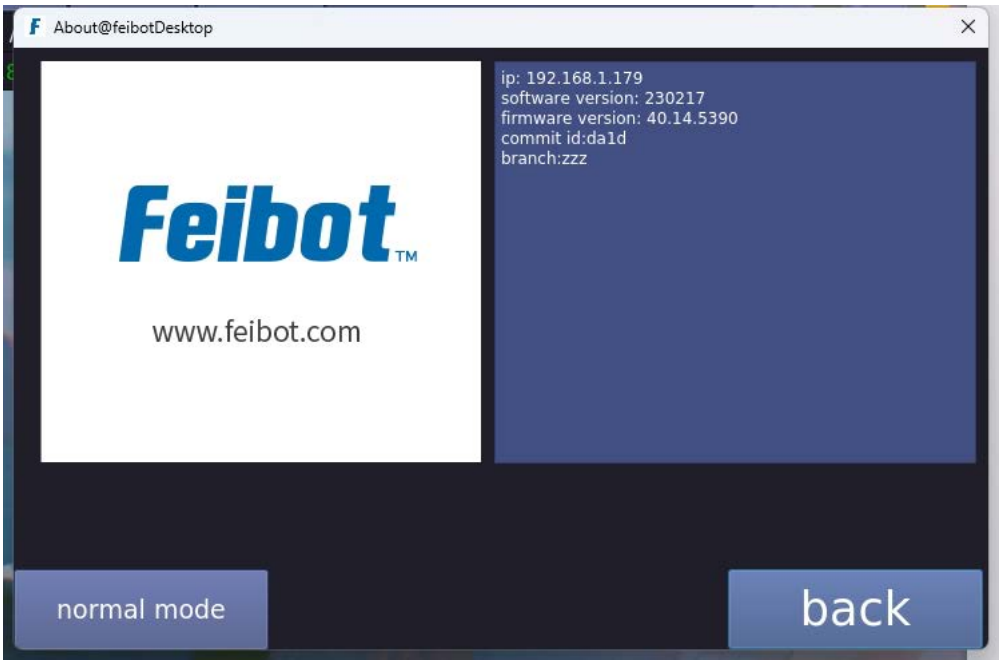
4.11 Advanced settings Interface



1) Options: can choose to set language/machine hardware type/server/post setting etc

2) Value: after choose options, then can edit value, click Set, then restart the software, then the changes will be valid.

4.12 About Interface



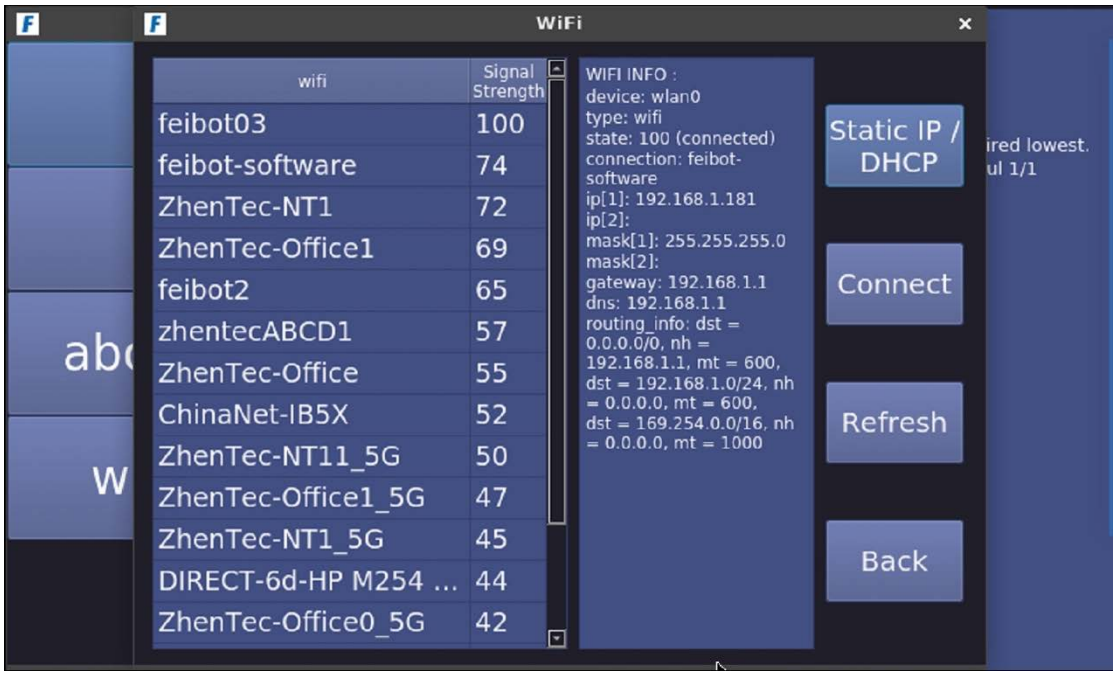
1) About This Device: IP address, software version, firmware version, commit ID, branch version

2) Click to select "Test Mode" or "Normal Mode". Switch into Test Mode for software upgrades, usually use under Normal mode.

4.13 Shut Down

Click Shut down button here, after the system is off, then turn the reader on by press the power button.

4.14 WIFI



1) Can choose WIFI and put in password on this page.

4.15 Menu Bar Icon

1)  Connection statua

2)  Start the software

3)  Stop the software

4)  Turn on the keyboard

5)  Open the terminal

6)  Open file folder

7)  Advanced network settings

8)  Downgrade into previous stable version

9)  Upgrade to the latest new version

10)  Shut down system and restart

5. Installation

You will need the following components:

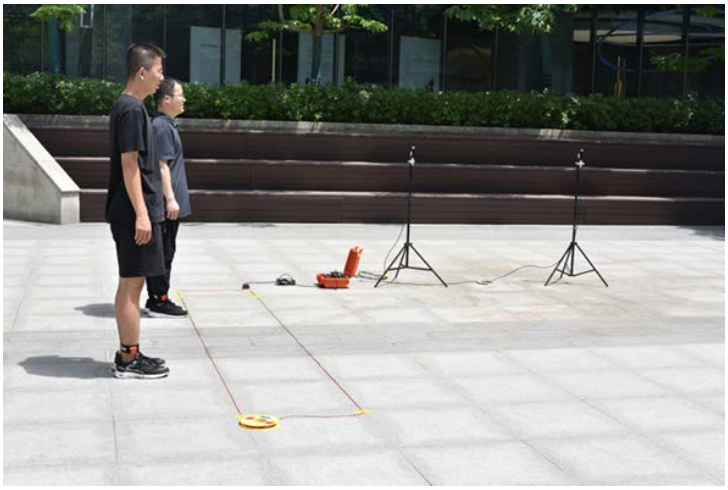
1) Active reader
2) Low frequency (LF) cable loop
3) LF cable extension
4) LF extension box
5) High frequency (HF) antenna
6) HF cable extension (optional)

5.1 Connect the HF Antenna

Attach HF Antenna to the Reader:

- Connect the HF antenna directly to the reader.
- Alternatively, use an extension cable to position the antenna on a tripod if there is signal interference.

  Place the HF antenna near or after the loop so that athletes pass the loop first, then the HF antenna.
- Use an extension cable to place the HF antenna if there are obstructions or the loop area is longer than 5 meters.



Note: Ground, water, metal, human bodies, and tall objects have absorbing and blocking effects on 2.4 GHz high-frequency signals, which can degrade the transmission performance of 2.4 GHz high-frequency signals. Therefore,

- Please place the A400 reader and HF antennas away from to these negative factors to optimize 2.4 GHz signal transmission.
- During the race, it’s recommended to palce the reader on a table, keep it 1 meter above from ground to receive the tag data better

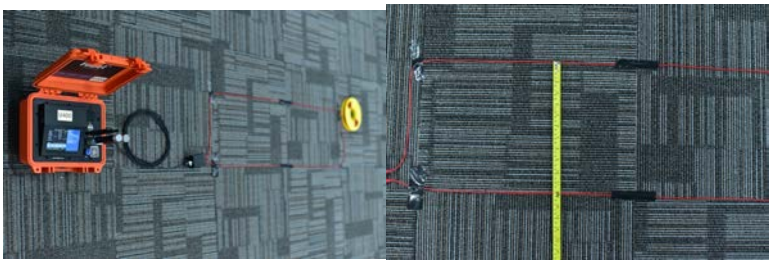
5.2 Connect the LF Components

LF Extension Cable and Box:

- Connect the LF extension cable and box to the reader, can use either of the LF ports

Set Up the LF Loop Cable:

- The typical loop width is 10-80 cm, can adjust loop width based on chip height, speed, and required accuracy.
- Test the loop setup by holding the chip and approaching the loop, make sure it reads correctly at the desired distance and height.



Note: A wider loop increases detection range but reduces accuracy.

5.3 Position the Chip

- Ensure the chip is worn vertically on ankle or placed vertically on bicycle

5.4 Configure the Reader

Turn On/Off Ports:

- Use the reader screen to enable or disable the loop port.
- If the loop is not connected properly, the reader will indicate a connection break.

Adjust Power Settings:

Set the power between 10% and 100%

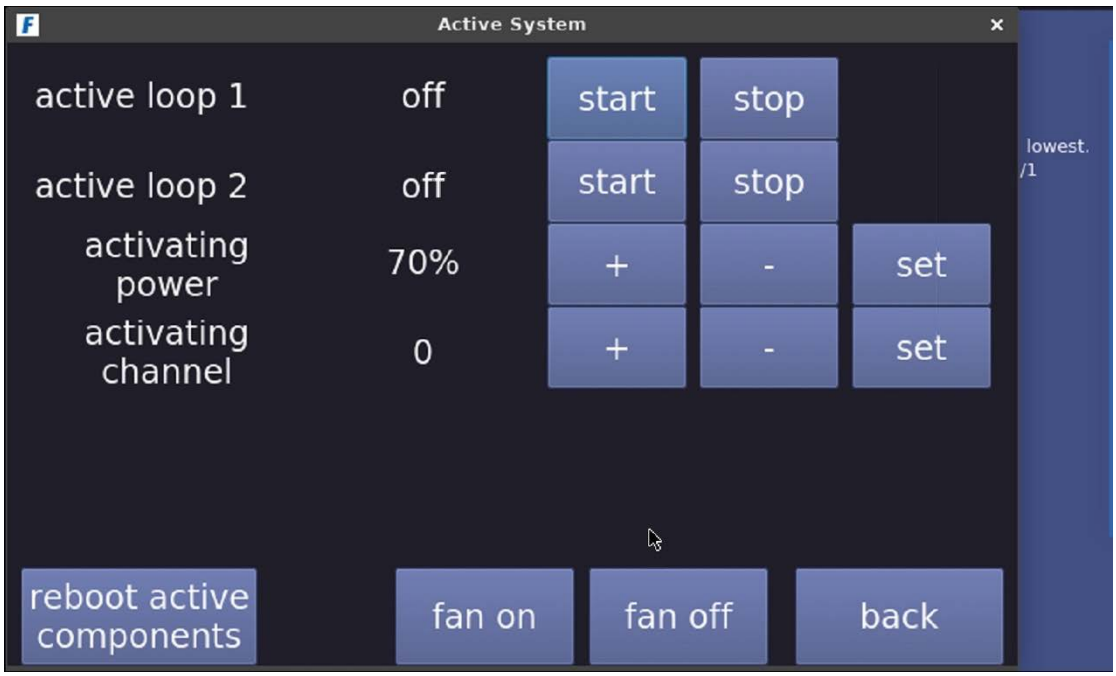
Set HF Channels:

- There are 6 HF channels (0-5). The default is 0, which is the strongest.

Note: Managing RFID Channel Interference

When readers are close to each other, (0~200m), there might be channel interference, causing data reception errors. To prevent this:

- Ensure devices using channel 0 are spaced at least 200 meters away from other readers.
- Using non-zero channels to readers in close proximity, eg reader A at channel 1, reader B at channel 2.



5.5 Precaution for using

- **Multiple A400 readers at the same location**

When using multiple readers at the same location, ensure they operate on the same channel, eg. all on channel 0, or channel 1. The two LF loops that's connected to the same reader should be kept at least 2 meters apart. For LF loops of different readers, maintain a distance of at least 4 meters.

6. Maintenance

- Keep the reader, antennas, and cables free from water, store them in dry places, humidity may damage reader screen.

- Keep the tags away from electronic device, remote controller etc, to avoid it been randomly activated and consume battery

- Use a dry, soft cloth to clean the reader screen.

- Regularly check all cable connections to ensure they are secure and free from damage.

- Inspect the antennas and ensure they are firmly attached.

- Do not let the reader run till the battery is completely off, that may lead to over discharge and damage battery. Charge the reader when there is warning beep for low battery.

- Do not charge the reader when it's unattended.

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

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, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.