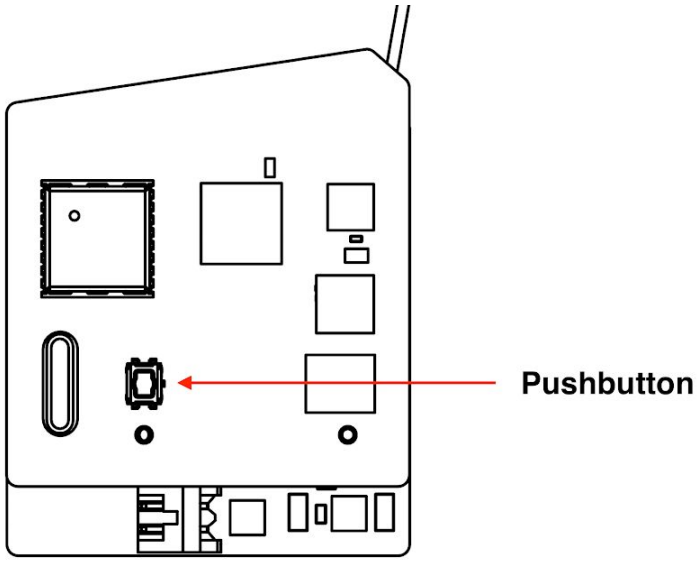
fx12 User Guide

Getting started

fx12 Power-ON



fx12 is OFF by default. To turn fx12 ON, press and hold the pushbutton next to the lightning connector, or the ***start button in case of fx12b***. You will hear 3 beeps which indicate that fx12 is now powered ON. After these 3 beeps, you can release the pushbutton (or start button) and fx12 will remain ON.

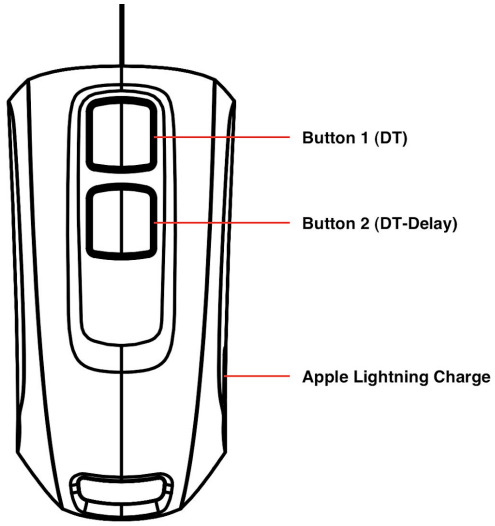
fx12 Power-OFF

To turn fx12 OFF, you press and hold the pushbutton (or start button) for 7 seconds, until fx12 resets. After the reset, fx12 will perform 3 beeps. If you release the pushbutton before the 3 beeps are finished, fx12 will be powered OFF.

fx12 Reset

In the rare event that fx12 may become unresponsive, you can reset it by pressing and holding the pushbutton (or start button) for 7 seconds. This will trigger a hard reset of fx12. After the reset, fx12 will enter the power-on sequence as described above.

fxRDT Power-ON



fxRDT Power ON

You can use either of the 2 buttons to power it ON. Press and hold a button until the 3 beeps are completed. After that, you may release the button and fxRDT will remain ON.

fxRDT Power OFF

Press and release both buttons simultaneously. You will hear a quick sequence of beeps which indicate that the device is now powered off.

fxRDT Auto Power OFF

When fxRDT is ON and not connected to an iPhone via Bluetooth and has not received GPS telemetry or any button pushes, it will power itself OFF after a period of 1h.

fxRDT Reset

In the rare event that fxRDT may become unresponsive, you can reset it by pressing and holding both buttons for 7 seconds. This will trigger a hard reset of fxRDT. After the reset, fxRDT will enter the power-on sequence as described above.

Charging

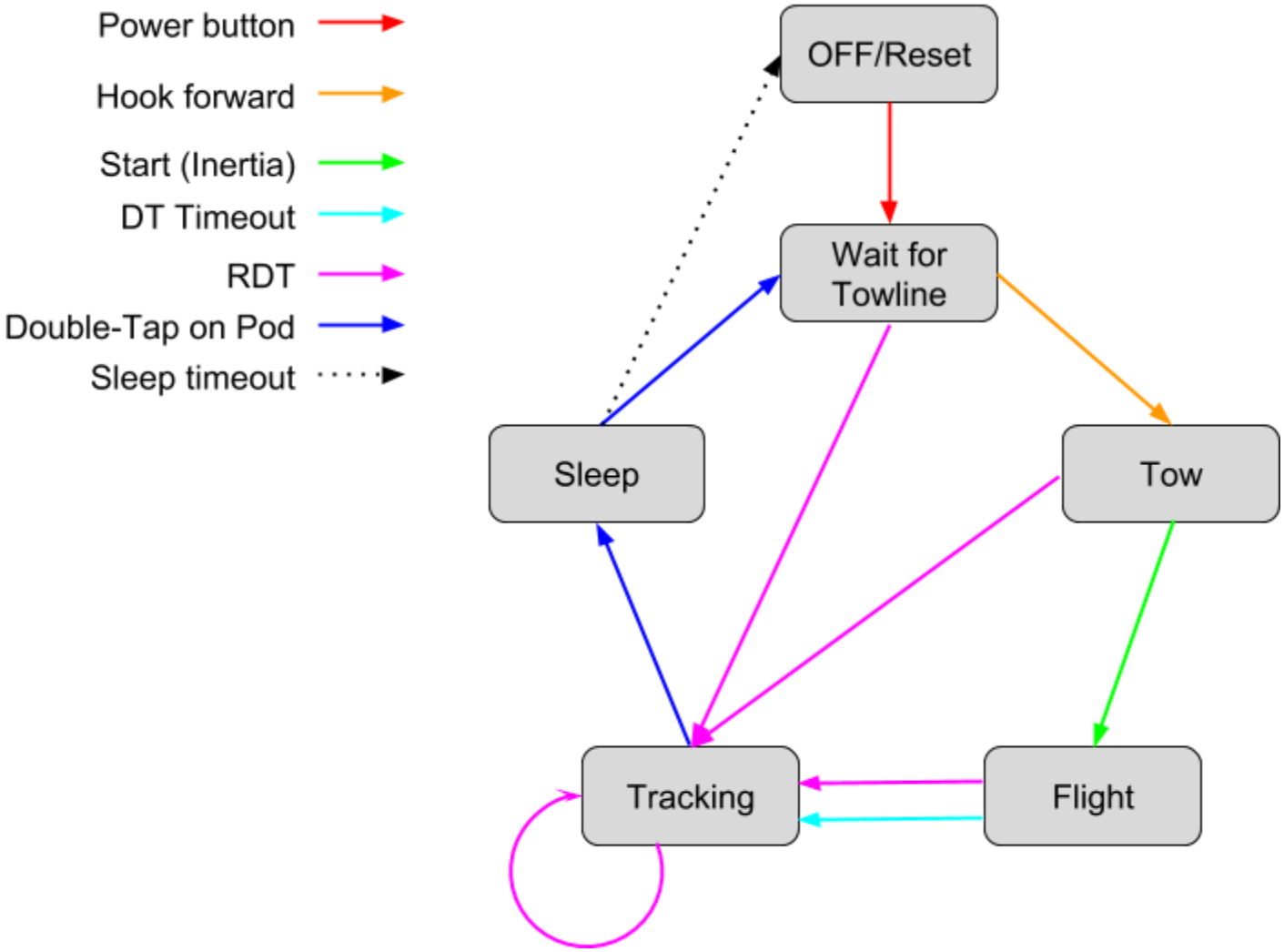
fx12 & fxRDT include a built-in LiPo & LiPo charger. Charging occurs when an *Apple Lightning* charge cable (same as iPhone) is connected to the charge connector. An LED next to the lightning connector, or on the back side of the fxRDT, indicate if charging is in progress or not.

Note: Only use a genuine Apple Lightning cable to charge fx12 and fxRDT! If you use any 3rd party lightning cable, warranty is void!

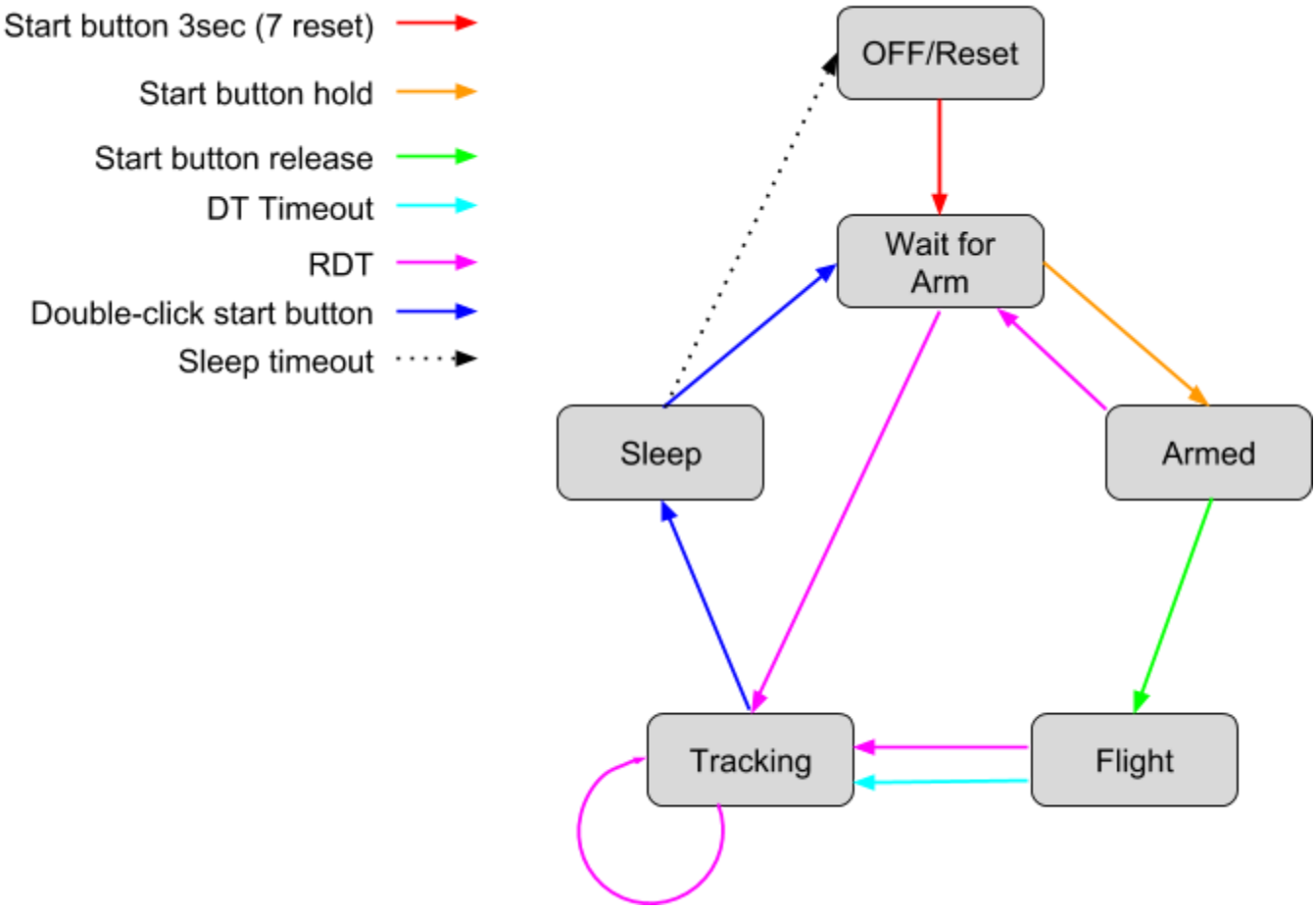
Runmodes

fx12 operates by cycling thru different states. These states are called Runmodes. The diagrams below show the different runmodes for fx12a and fx12b and all possible transitions between each of the runmodes.

fx12a Runmodes



fx12b Runmodes



fx12.app

How to get the app for my iPhone?

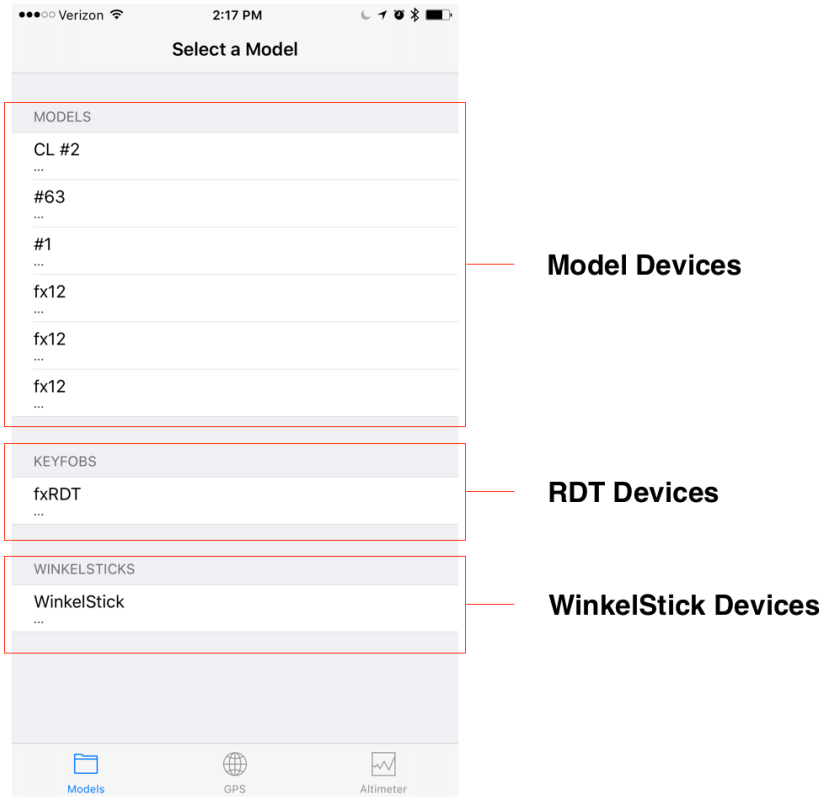
Available on the App Store

Tab Bar

The Tab Bar at the bottom of the screen is fx.app's main navigation interface. It lets you select one of 3 sections of the app:

1. Models (Devices) - Interact with as model or device
2. GPS - Locate models on a map
3. Altimeter - Evaluate Altimeter data for recorded flights

Devices



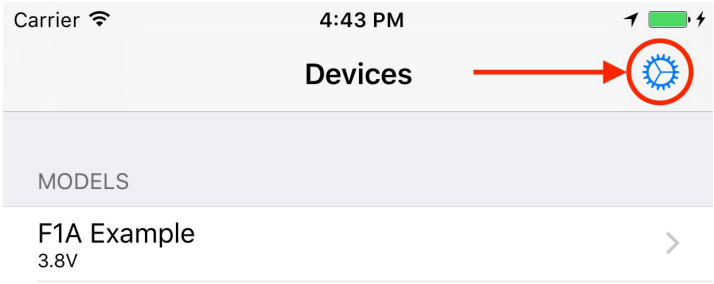
The Models Tab has 3 sections:

1. Models - Select which model you want to interact with
2. Keyfobs - Manage connected fxRDT devices
3. WinkelSticks - Manage connected WinkelStick sensors

Note: This list (like any other list in fx12.app, can be refreshed by pulling it down (similar to how the mail app works).

Device Management

The device list is initially empty. You must first pair your devices & models once, so they can show up in the device list. To do so, bring up the device management screen by clicking the gear icon in the upper right of the device list:

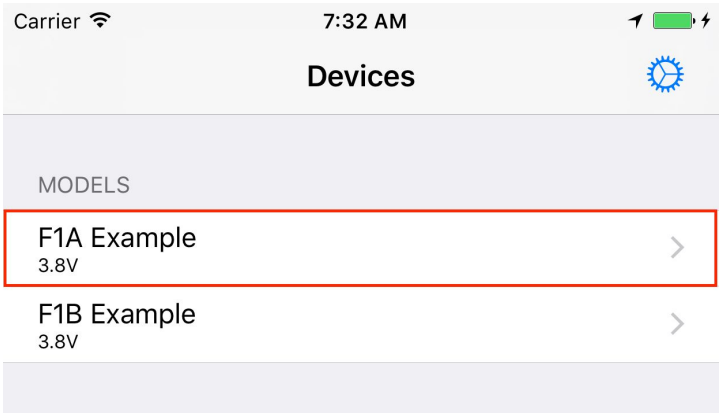


TBD Screenshot of device discovery

After you have added a model (or fxRDT) to your device list, the iphone will automatically connect to it anytime it's turned on and within range of the iphone. When the iphone is connected to the model, a triangle will be shown on the right side of the model row in the device list.

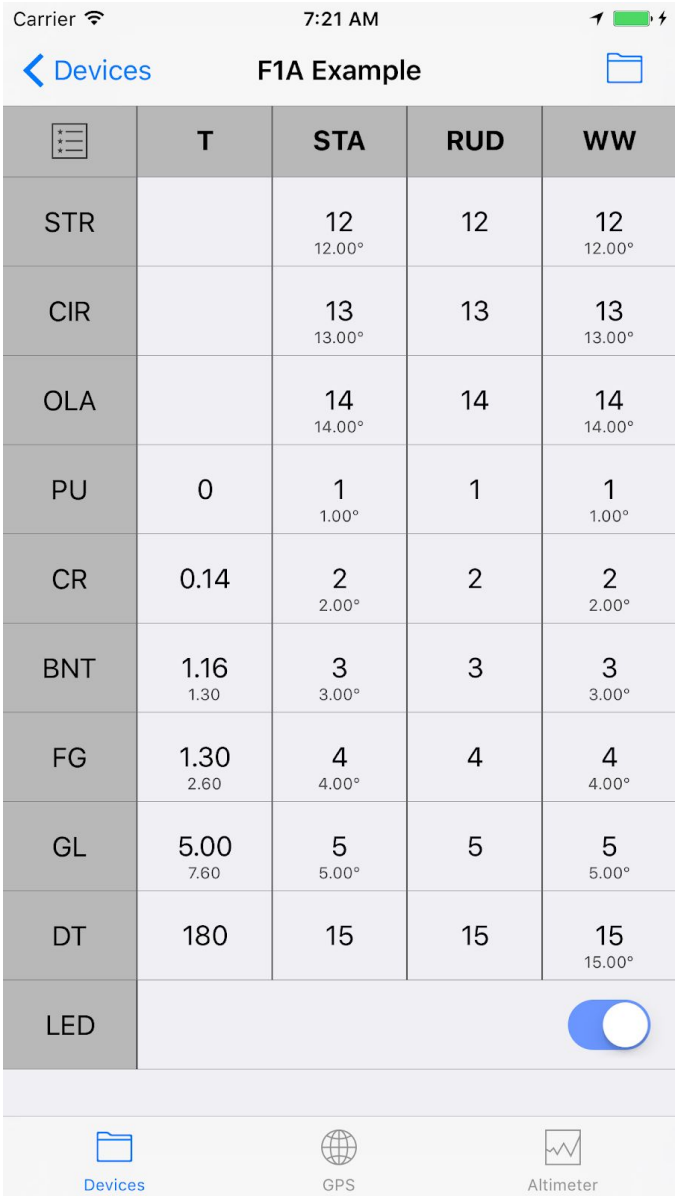
Program Table

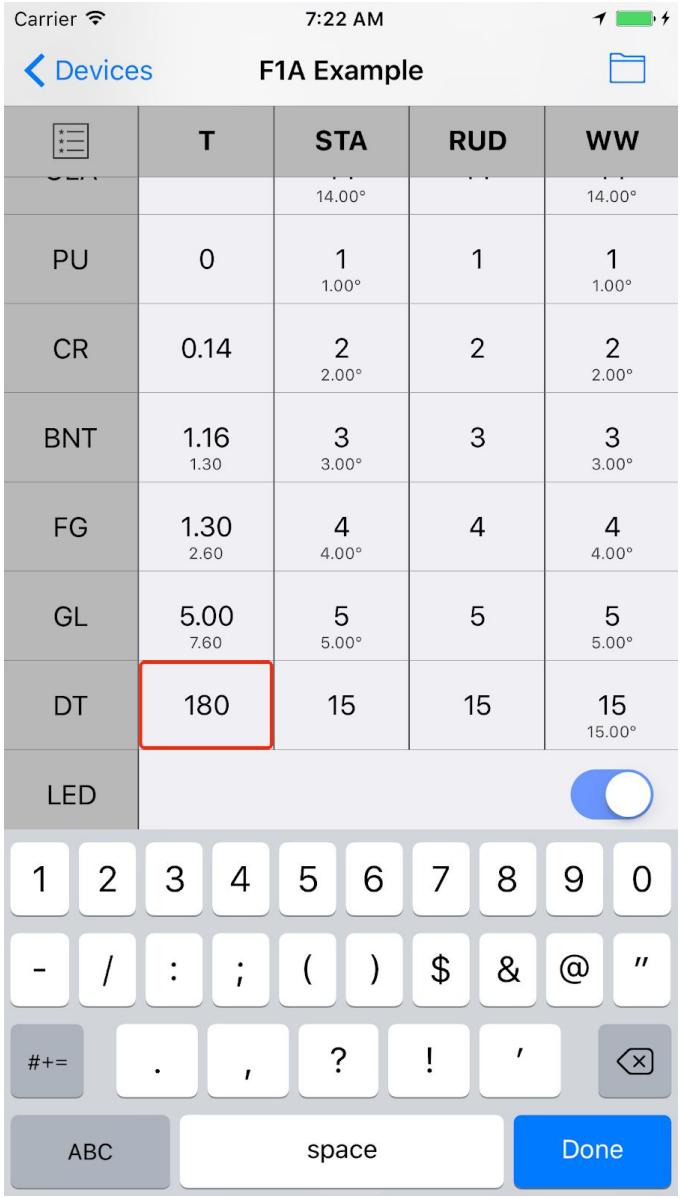
To enter the flight program table for a model, simply click on the model row in the device list while the model is connected. The connection status is indicated by the triangle on the right.



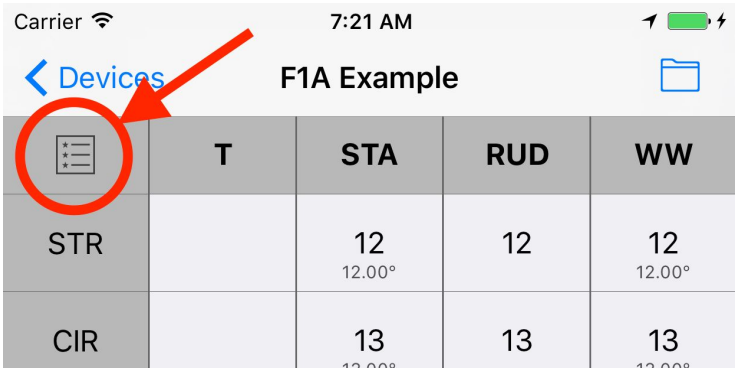
The program table shows the flight program currently stored in the model. This table can only be accessed when the iphone is connected to the model. The fx12 system does not need to download a program from the

model, nor does it need to upload a changed program to the model. What you see is always what's in the model and any change is directly applied to the model. To make a change, just click a program parameter and edit it. When you press done, the change is immediately stored in the model.

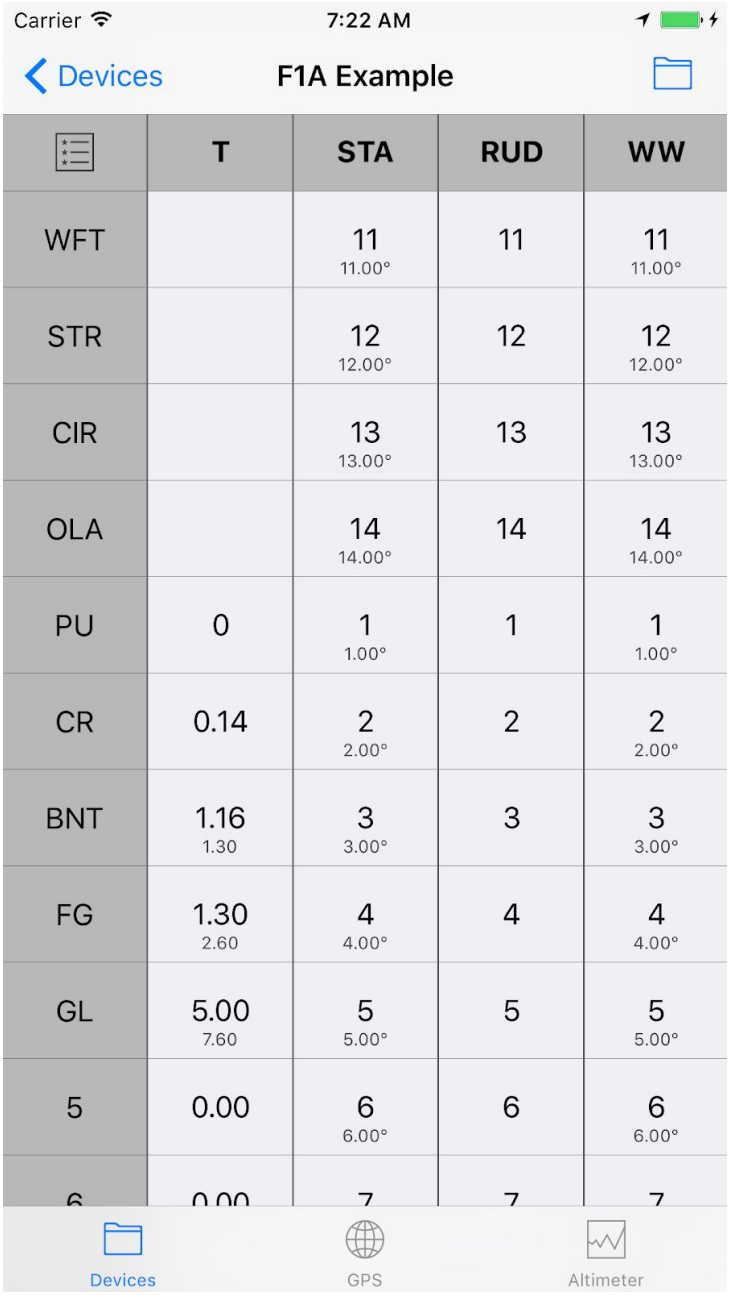




By default the table only shows commonly used rows of the flight program. To show all rows, click the table reveal button in the upper left.



This will show even the hidden rows. Regular time steps, are hidden when their time is 0. To add another row to your flight program, set it’s time to be bigger than the previous row.



Relative & Absolute time

In the flight program table, the time column shows the relative time for each time step as the main, editable value.

PU	0
CR	0.14
BNT	1.16 1.30
FG	1.30 2.60

The cumulative, absolute time is shown in the secondary, smaller value just under the main value.

PU	0
CR	0.14
BNT	1.16 1.30
FG	1.30 2.60

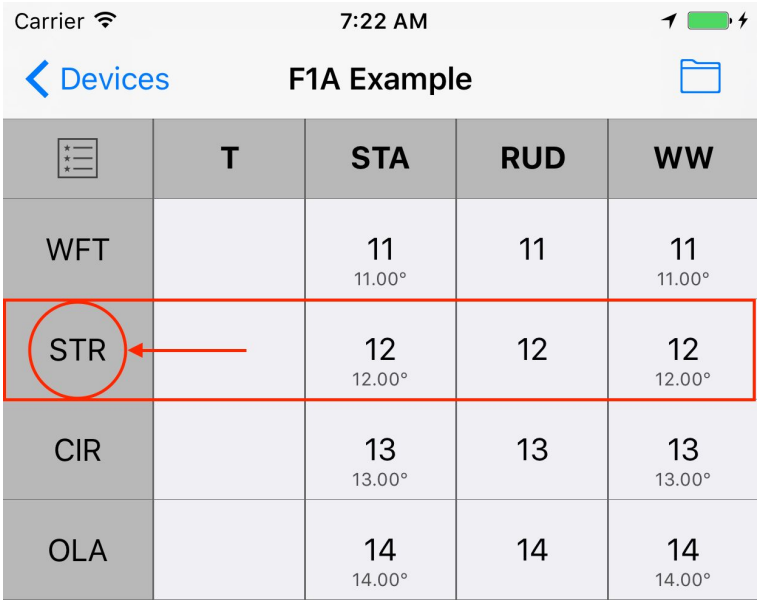
Servo value & Angles

If you have measured your Stab or WW with a WinkelStick, the flight program table shows you the angles just under the servo value. Depending on your setting for value entry (see details section), the angle is shown as the main, editable value and the servo value is the secondary value.

CR	0.14	2 2.00°	2	2 2.00°
CR	0.14	2 2.00°	2	2 2.00°

Servo Movement

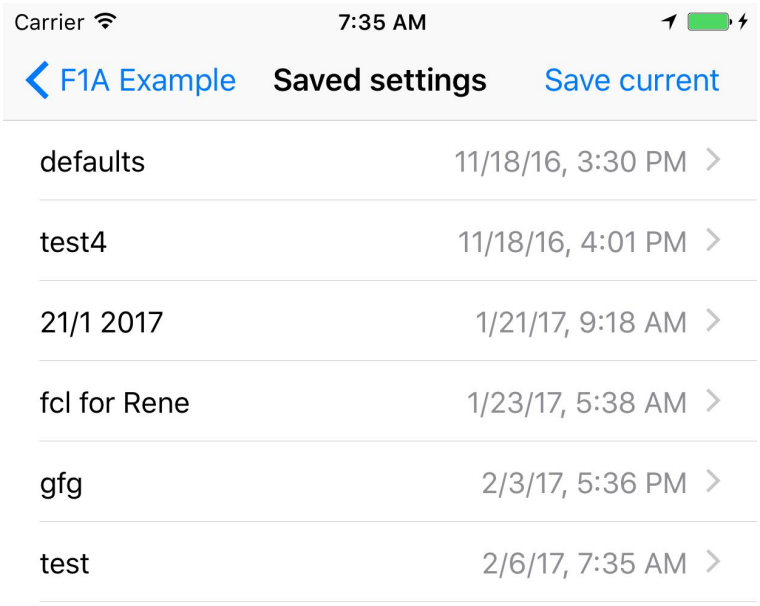
To check the servo positions for any row in the flight program, simply click on the first column of that row. All servos will move to the positions of that row.



Saving & Restoring a flight program

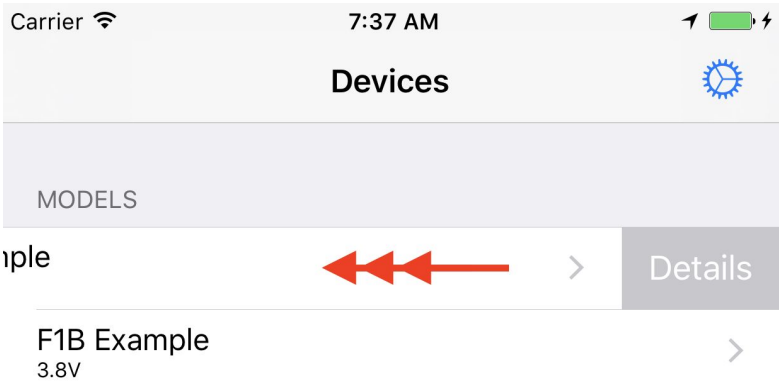
Sometimes you may want to save a flight program for later use. For example, you may try some different settings for wind and calm. In the upper right corner of the flight program table you can find a folder symbol. If you click it, you can access the saved program list.

In the saved program list you will see previously saved programs for this model. You can load any of these programs into the model by clicking on one of them. Alternatively you can save the program that is currently in the model by clicking on “Save current”.



Device Details

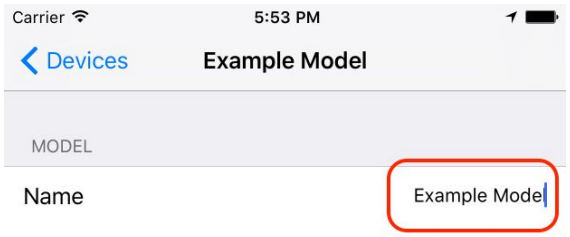
To enter the model details, slide the model row to the left to reveal the model details dialog button.



Note: For fxRDT and fxWS, simply tap on the device row to enter that device's details dialog.

Device name

To change the name of a device, enter your desired name in the device details, name field and hit enter.



Important: After you change the name, you will have to reboot the device and your iPhone!

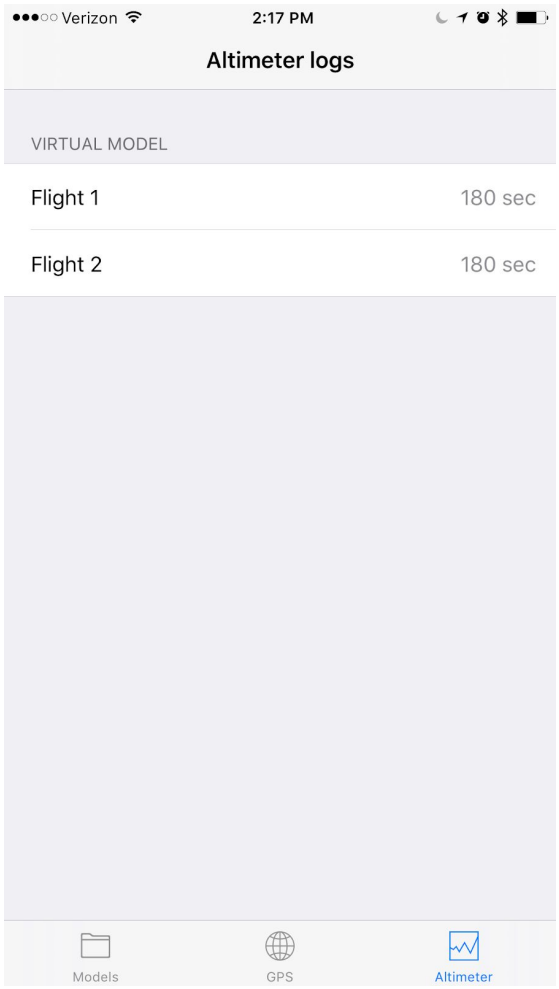
Channel

In it's default state, fx12 is programmed to operate on RF channel 0. In order to avoid conflict, each customer should operate on a unique channel. To key your fx12 and RDT to your channel, simply connect all of your models and RDT units at least once to your iPhone fx.app. fx.app will automatically set all your equipment to a channel that is aligned with the serial number of your iPhone. This guarantees that each customer has a unique channel.

Note: If you change your iPhone, or reinstall fx.app, you have to repeat this process.

Altimeter

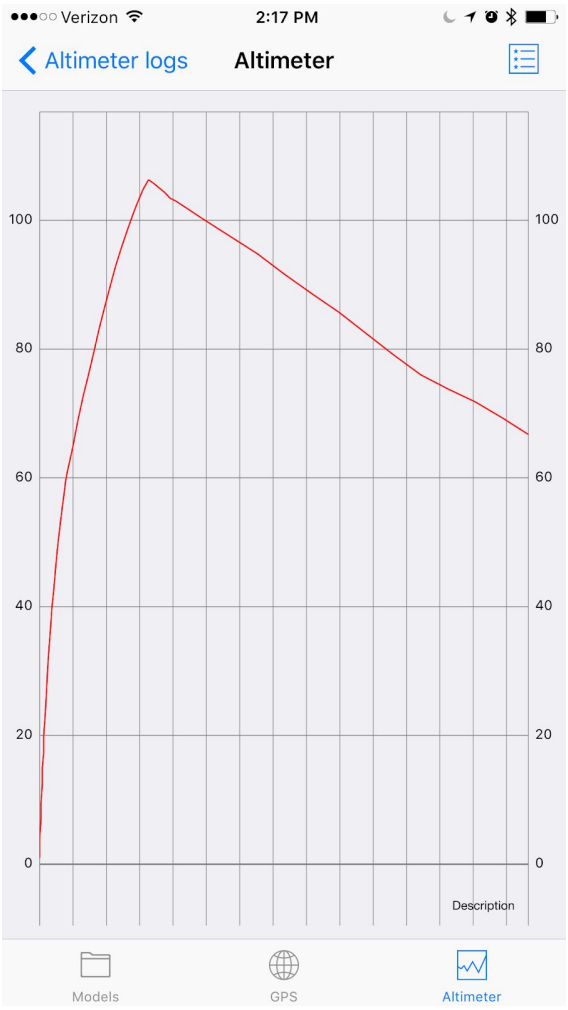
The altimeter section provides a way to view and manage stored altimeter logs on a fx12 model.



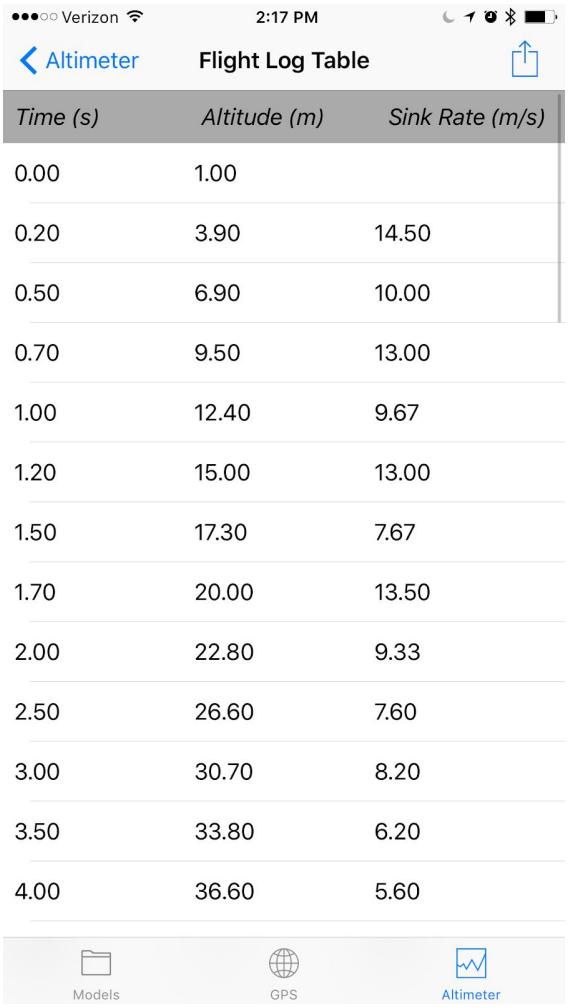
The main page shows all flights of all connected models. This page can be refreshed by pulling the list down. This shows what's stored on the models, not on the phone. There is no storage on the phone. As with editable parameters, there is no need to "download" (get) flights.

You can delete flights from this page.

If you select a flight from the list, you will enter the graph detail view. It shows a graphical representation of the flight.



Once in the graph view, the upper right provides access to the table view of the same data.



WFU - Wireless Firmware Update

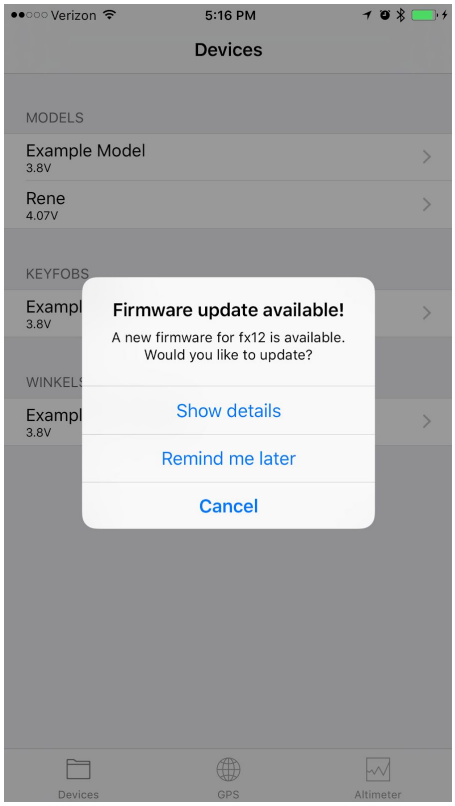
The fx12 firmware can be updated wirelessly over Bluetooth.

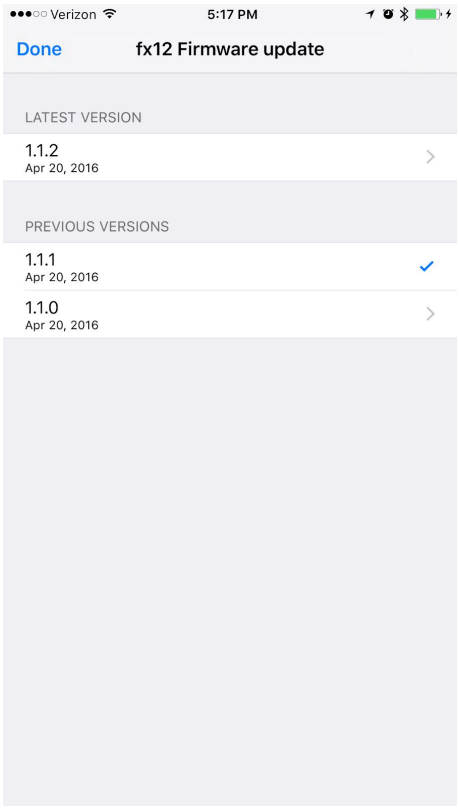
Before you begin:

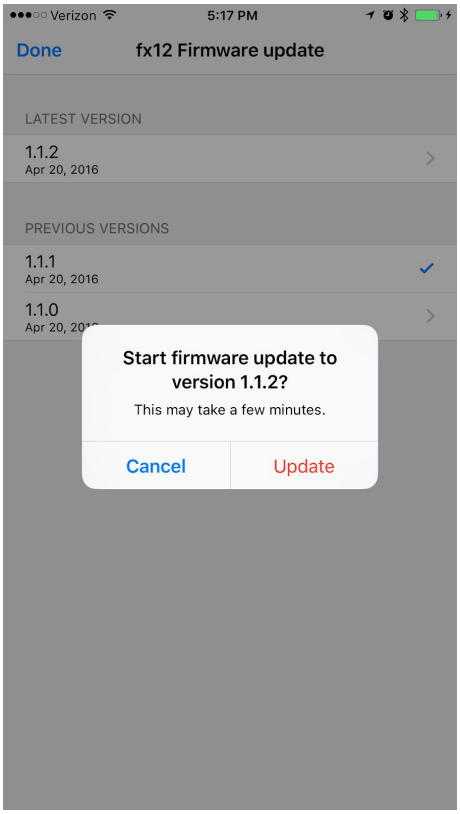
1. ***Reboot your iPhone***
2. ***reboot fx12 timer or fxRDT (depending on what you are trying to update)***
3. ***Turn off all other fx12 and fxRDT devices you have nearby. Turn off all other Bluetooth devices you may have paired with your iphone.***

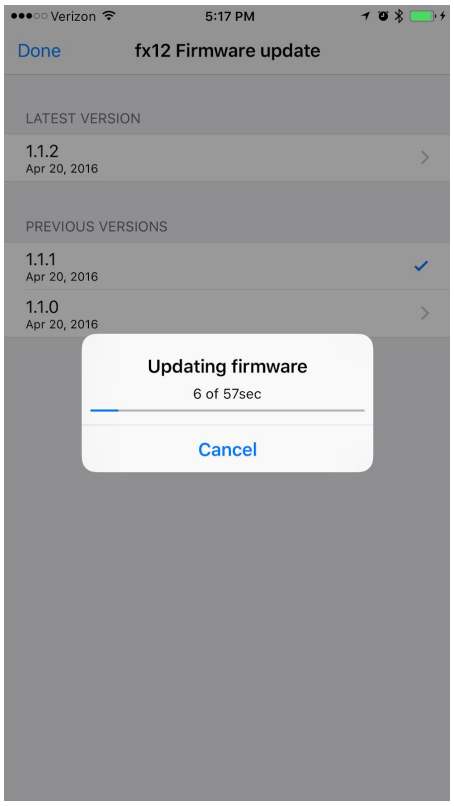
This process works in 2 steps:

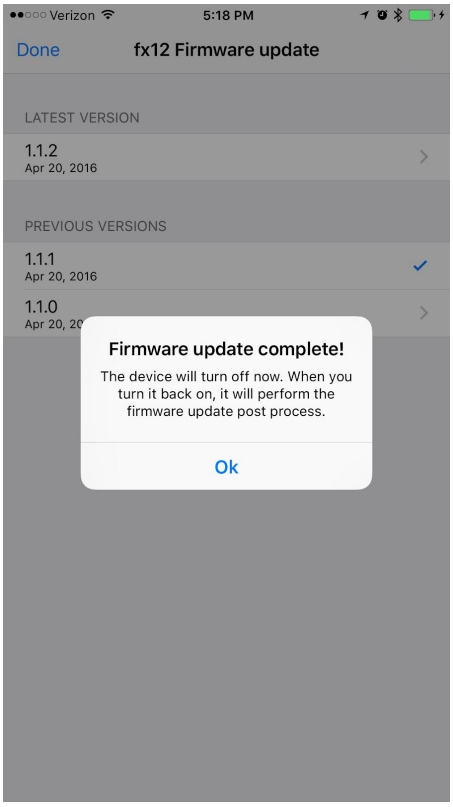
1. Respond to a WFU notification or navigate to model details and click on the current firmware version. Select the latest firmware version from the list and start the upload process. Fx.app will upload the new firmware image to the fx12 timer. During this upload, you will hear some noise, that indicates the progress. The upload will take several minutes. ***NOTE: During the WFU process, DO NOT interact with fx12 or fxRDT nor with your iPhone. If you receive a phone call during this time, it may interrupt the WFU process.***
2. After a successful upload, fx12 will turn itself off. When you power it back on, fx12 will check if there is a valid new firmware image, and if that's the case, will replace the old firmware with the new one. During this update process, fx12 will make a continuous noise and then start as usual. Keep the reset button pressed until fx12 appears to be in normal operation mode again, indicated by a short beep every 2 seconds.


Verizon
5:16 PM
Devices
MODELS
Example Model
3.8V
Rene
4.07V
KEYFOBS
WINKELS
Firmware update available!
A new firmware for fx12 is available.
Would you like to update?
Show details
Remind me later
Cancel
Devices
GPS
Altimeter


Verizon
5:17 PM
Done
fx12 Firmware update
LATEST VERSION
1.1.2
Apr 20, 2016
PREVIOUS VERSIONS
1.1.1
Apr 20, 2016
1.1.0
Apr 20, 2016


Verizon
5:17 PM
Done
fx12 Firmware update
LATEST VERSION
1.1.2
Apr 20, 2016
PREVIOUS VERSIONS
1.1.1
Apr 20, 2016
1.1.0
Start firmware update to version 1.1.2?
This may take a few minutes.
Cancel
Update


Verizon
5:17 PM
Done
fx12 Firmware update
LATEST VERSION
1.1.2
Apr 20, 2016
PREVIOUS VERSIONS
1.1.1
Apr 20, 2016
1.1.0
Apr 20, 2016
Updating firmware
6 of 57sec
Cancel

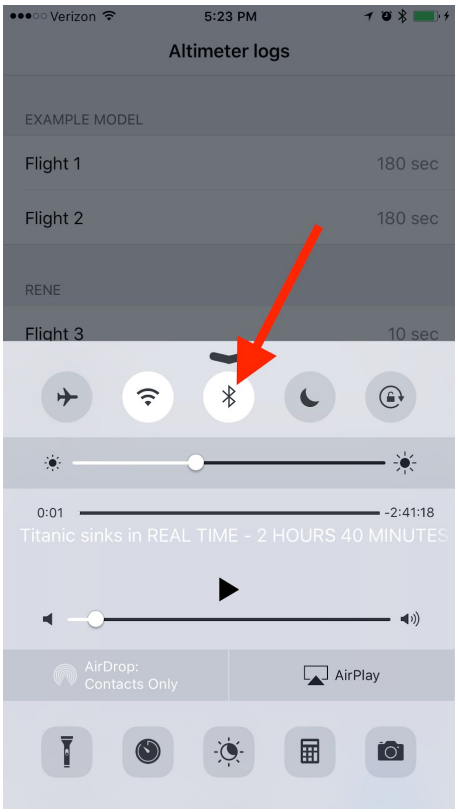

Verizon
5:18 PM
Done
fx12 Firmware update
LATEST VERSION
1.1.2
Apr 20, 2016
PREVIOUS VERSIONS
1.1.1
Apr 20, 2016
1.1.0
Firmware update complete!
The device will turn off now. When you turn it back on, it will perform the firmware update post process.
Ok

Note: If you chose “remind me later”, fx.app will not remind you to update this particular firmware version for 30 days. Any new versions that may become available, will show a notification again. We recommend you always use the latest version of the firmware.

Note: In rare cases, it may be necessary to update the firmware via the USB programing cable, see this document.

Working with iOS Bluetooth

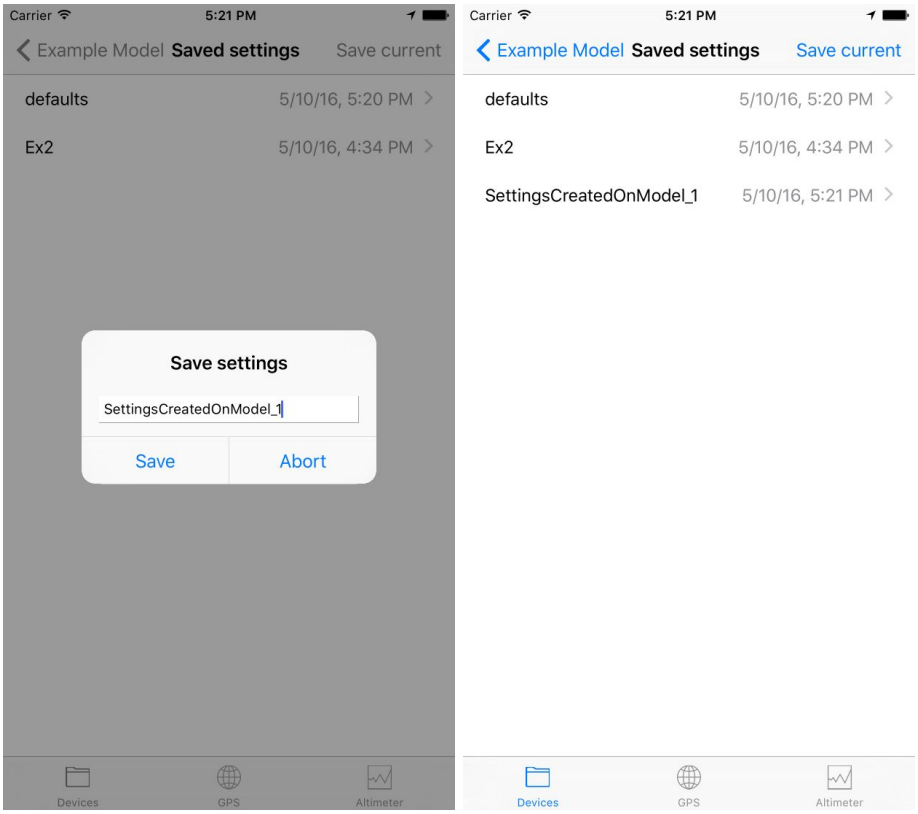
iOS Bluetooth can sometimes get into a state where it no longer performs as expected. You will notice this by seeing some very odd numbers in the settings screen, or may see errors during firmware update. The easiest way to fix these problems is to restart iOS Bluetooth. You can do this by turning BT off in the dashboard, wait 5 seconds and then turn it back on. In rare cases, this is not enough, and we recommend to reboot your iPhone and fx12 timer.



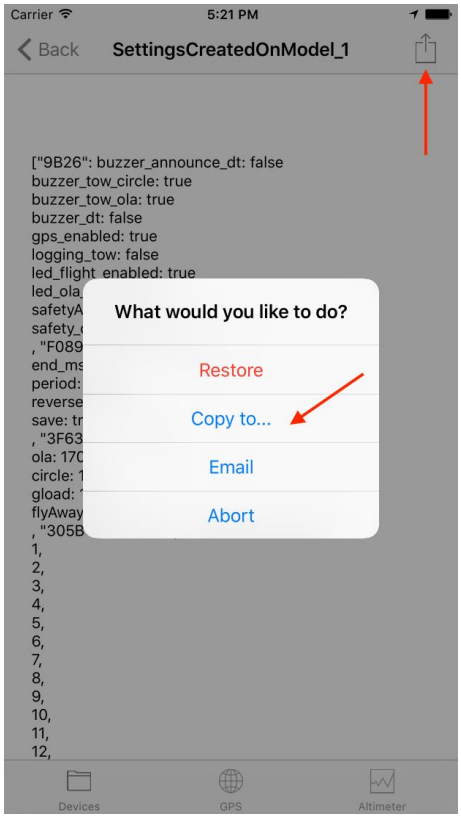
Copying a program from one model to another

Sometimes it can be useful to copy an existing program to another model. This can be done via the “Share” action in program folder of the model that has a program you want to reuse on another model.

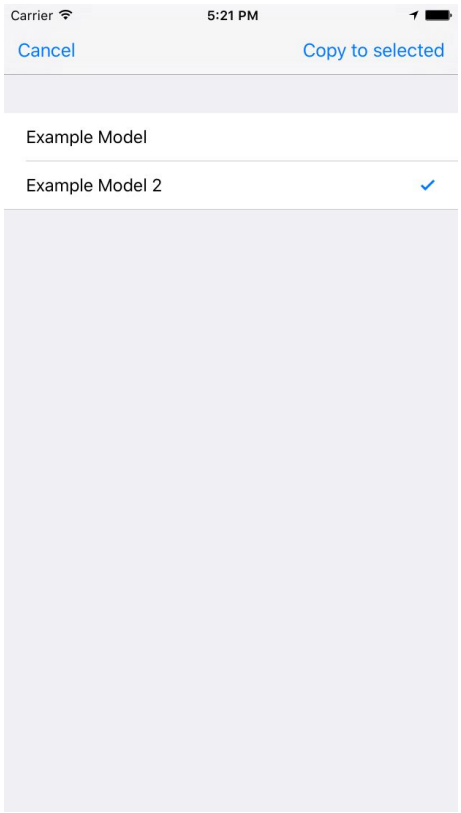
1. If you haven’t done so already, save a program on the original model



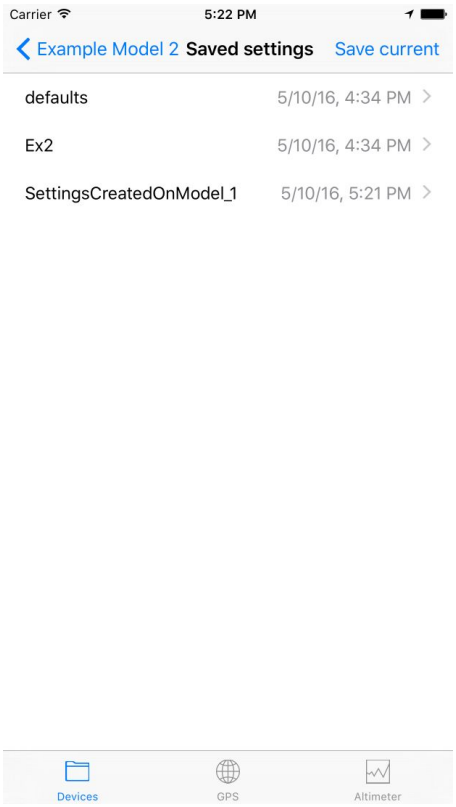
2. Select the program to go into the details dialog of the program. Now select the share action in the upper right corner so bring up the share dialog.



3. Select “Copy to”. The model selection dialog will appear. Select the model you want to copy the program “To”. This will be the destination. Select “Copy to selected” in the upper right. The program will be copied to the selected model.



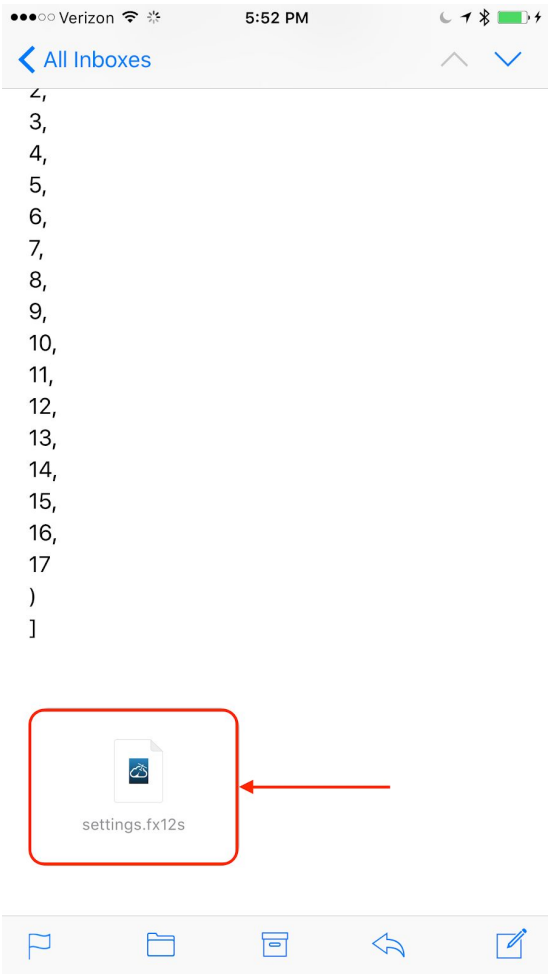
4. Verify that the program was copied to the desired model, by checking the program folder for that model. You should see the copied program. You may “restore” this program onto the fx12 timer in that model to apply the settings.



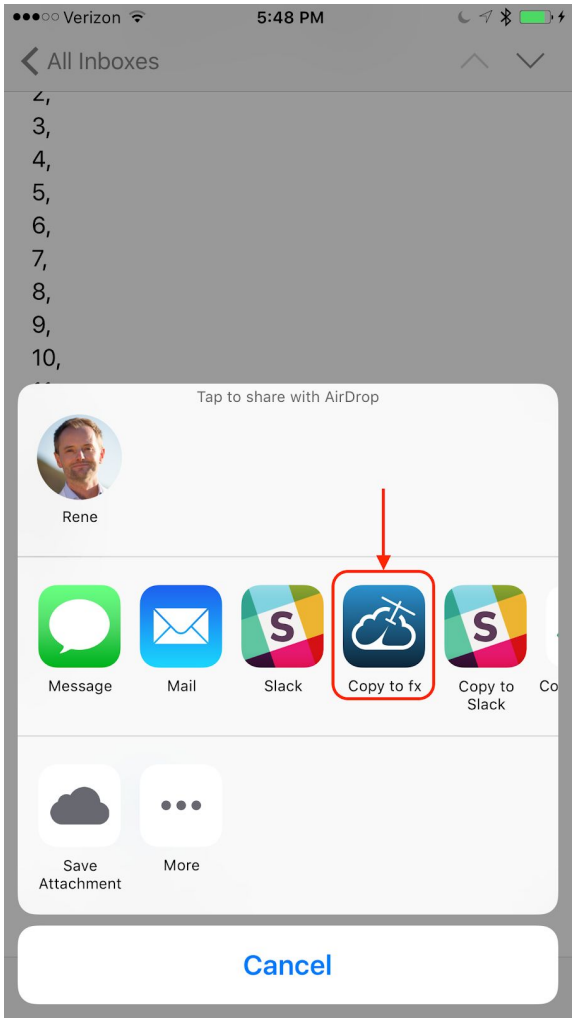
Importing a program from E-Mail or iMessage

If you have received an email or iMessage that contains a fx12 program attachment, it is possible to import it to a model of your choice.

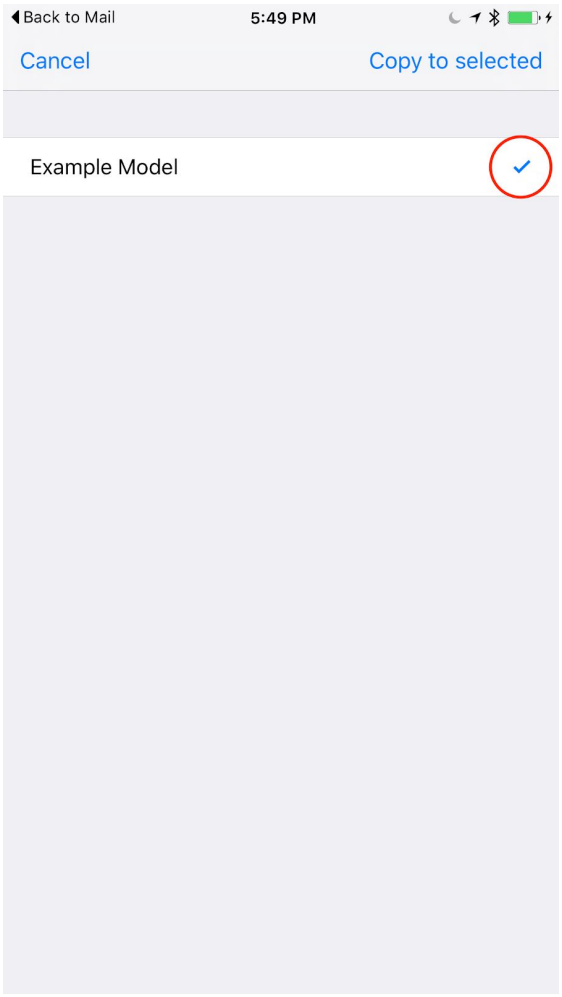
1. Select the attachment in the message window:



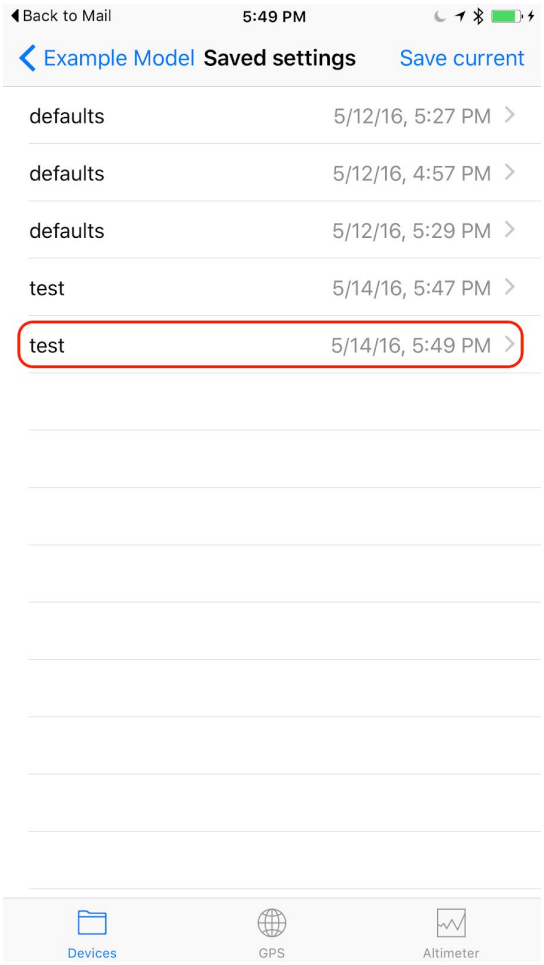
2. Choose “fx” from the iOS share sheet:



3. fx.app will open and present a list of models. Choose the model you want to import this program to:



4. You can verify the import by looking at the list of saved programs in the models program folder:



5. You may optionally apply (restore) this program to the model if you wish.

Renaming Servos

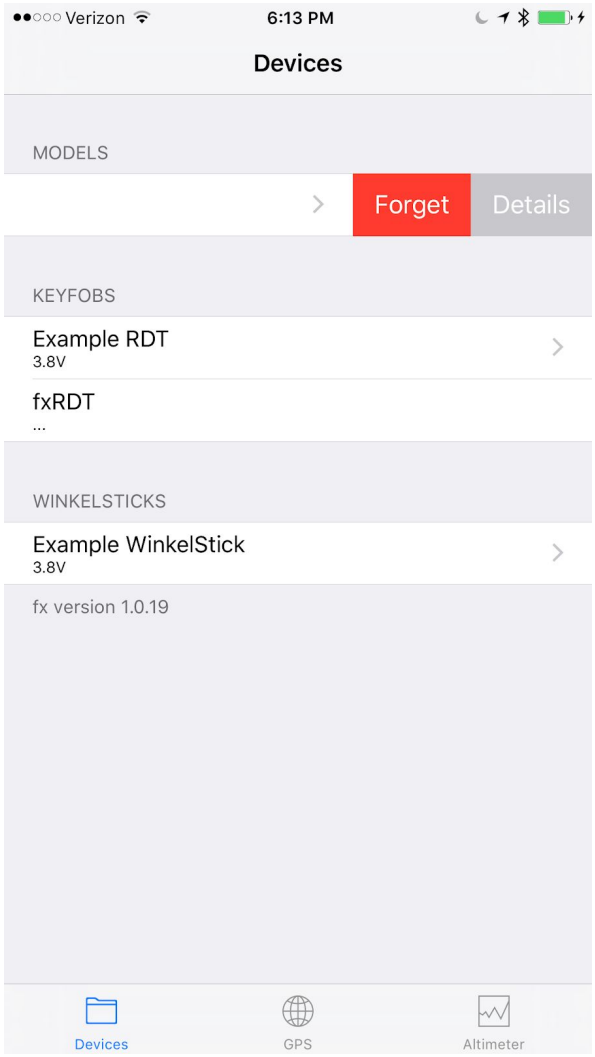
fx.app allows you to custom name your servos. By default, the servo's are named:

Servo	Default Name	Suggested name for Flapper
1	Stab	Stab
2	Rudder	Rudder
3	WW *(Wing Wiggler)*	FlapR
4	Flap	FlapL

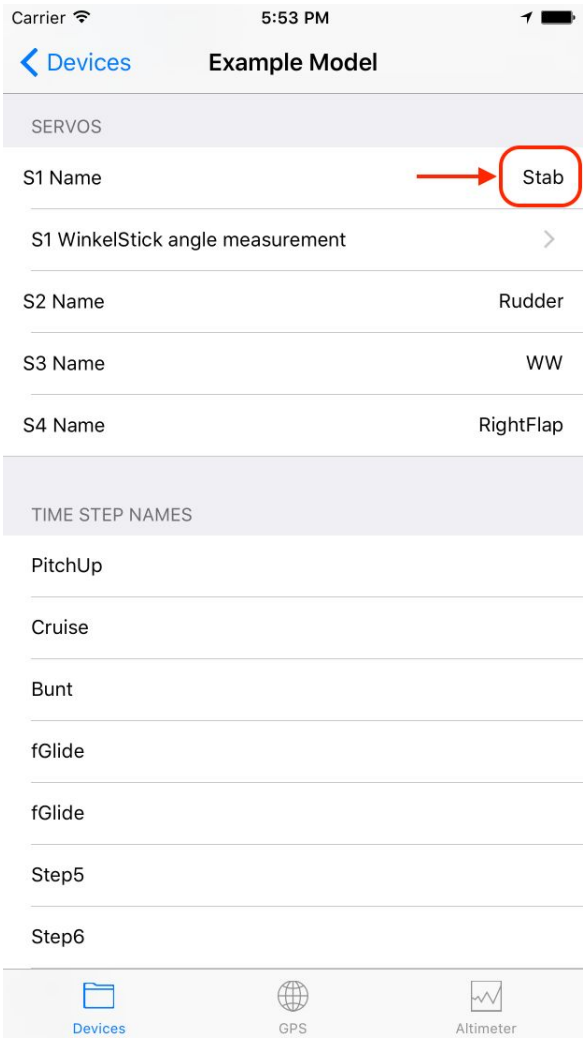
Note: The name of Servo 5 cannot be changed as it is dedicated to operate the hook latch.

To change the name of a servo:

1. Enter the model's detail view by sliding the model's row to the left and select "Details":



2. Change the name of the Servos by editing the name field for each servo:



Note: Renaming servos applies to the selected model only.

Note: When renaming time steps, beware of names that are too long. Keep in mind that these are combined with the name of the servos, for some of the parameters. Depending on your iPhone's screen size and the total length of your custom names, display may not be possible. We recommend you keep servo and time step names as short as possible.

Naming time steps

The fx12 operating system has a maximum of 10 time steps that can be performed during a flight.

Note: This does not include DT

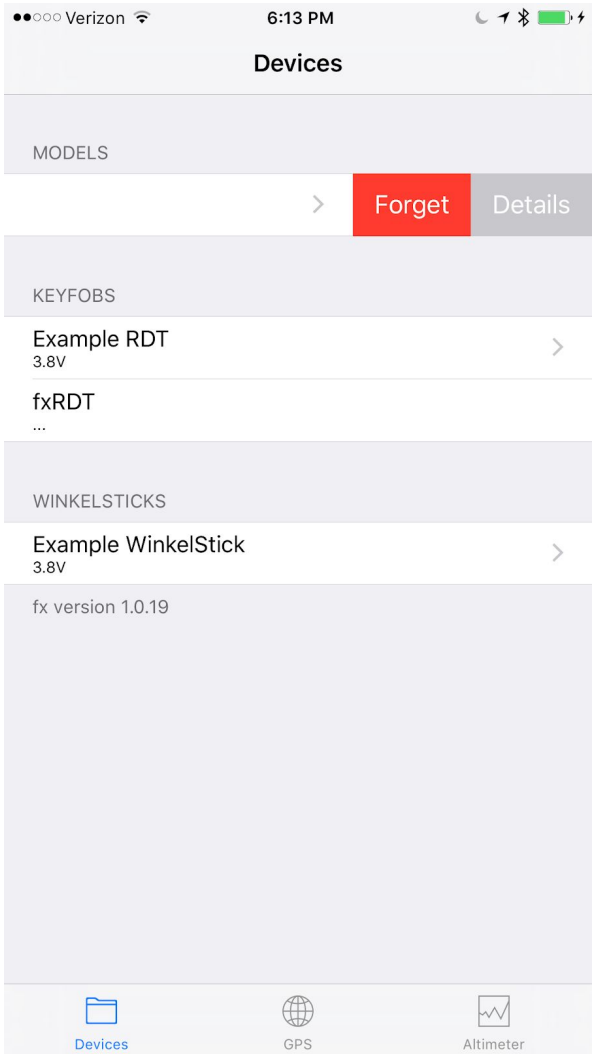
These steps can be renamed according to your preference. The default names are:

Step	Name

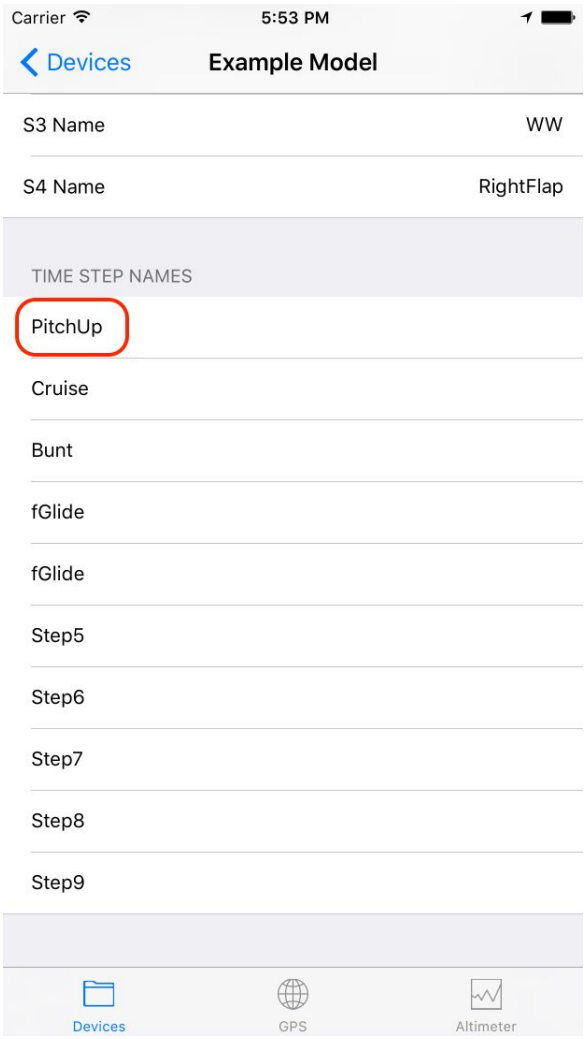
1	PitchUp
2	Cruise
3	Bunt
4	fGlide
5-10	Step<5..10>

To rename time steps:

1. Enter the model's detail view by sliding the model's row to the left and select "Details":



2. Scroll down to the time step names and rename the steps according to your preferred terms:



Note: Renaming time steps applies to the selected model only.

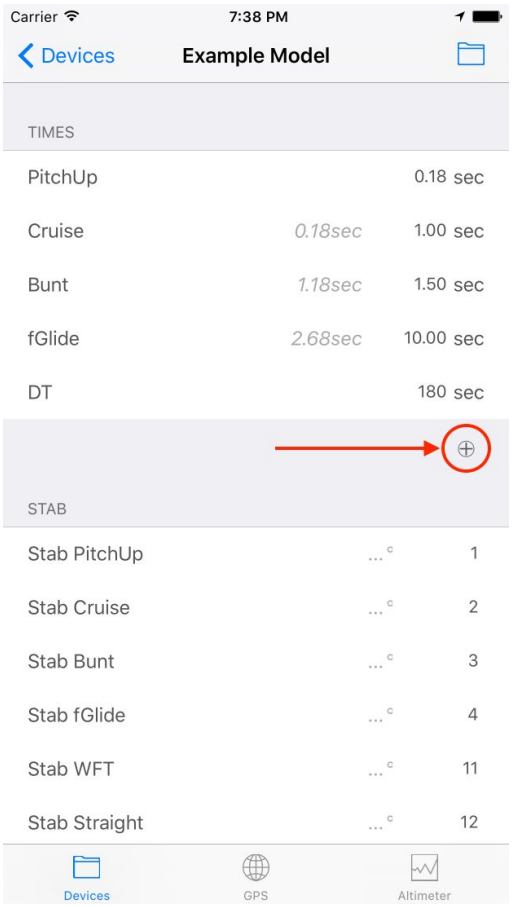
Note: When renaming time steps, beware of names that are too long. Keep in mind that these are combined with the name of the servos, for some of the parameters. Depending on your iPhone's screen size and the total length of your custom names, display may not be possible. We recommend you keep servo and time step names as short as possible.

Enabling and disabling time steps

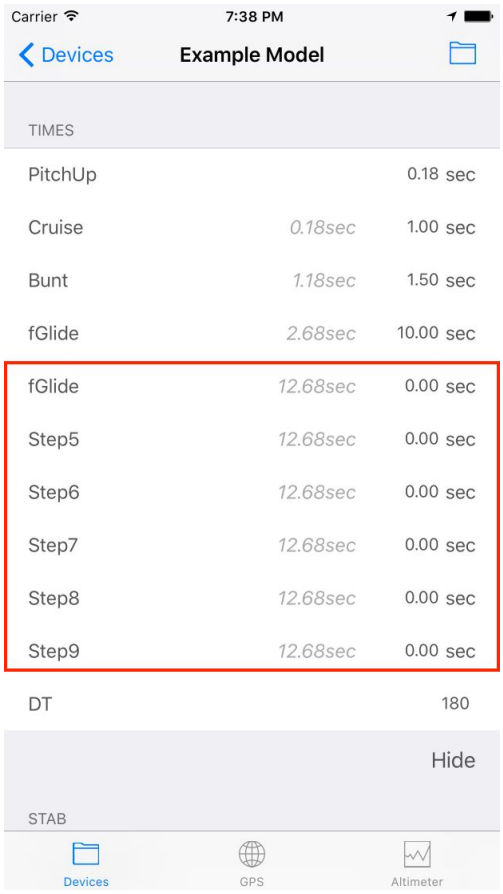
fx12 has a maximum number of 10 time steps. They start at Step 0 and end at Step 9. Any step that has a time of 0, is considered disabled. In addition, and steps after a 0 step, are also disabled.

By default, fx.app will only show time steps (and corresponding servo steps) up to, but not including the first step that has a time of 0.

To add more steps, you first need to reveal the disabled time steps. You can do this by selecting the “+” button at the bottom of the time step list.



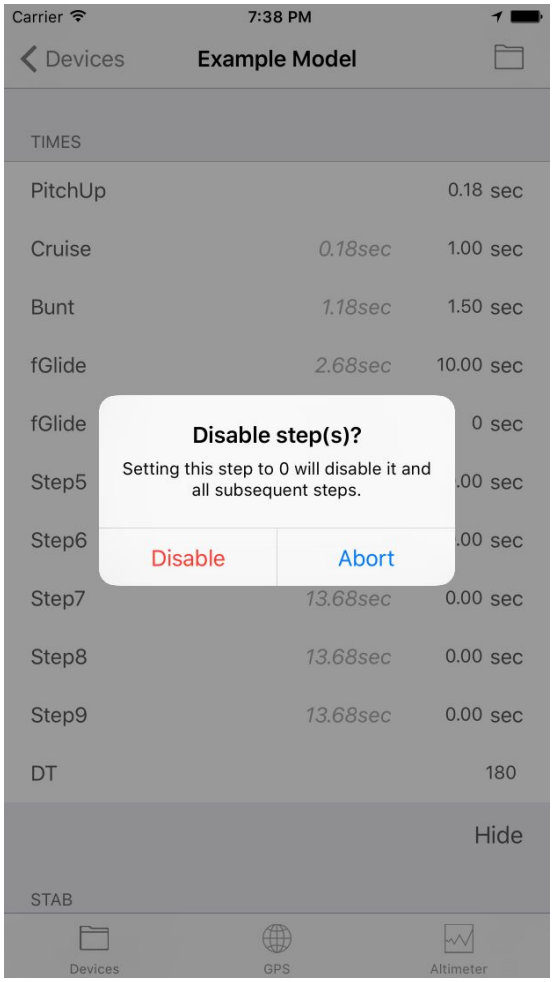
This will reveal all time steps that have been previously hidden.



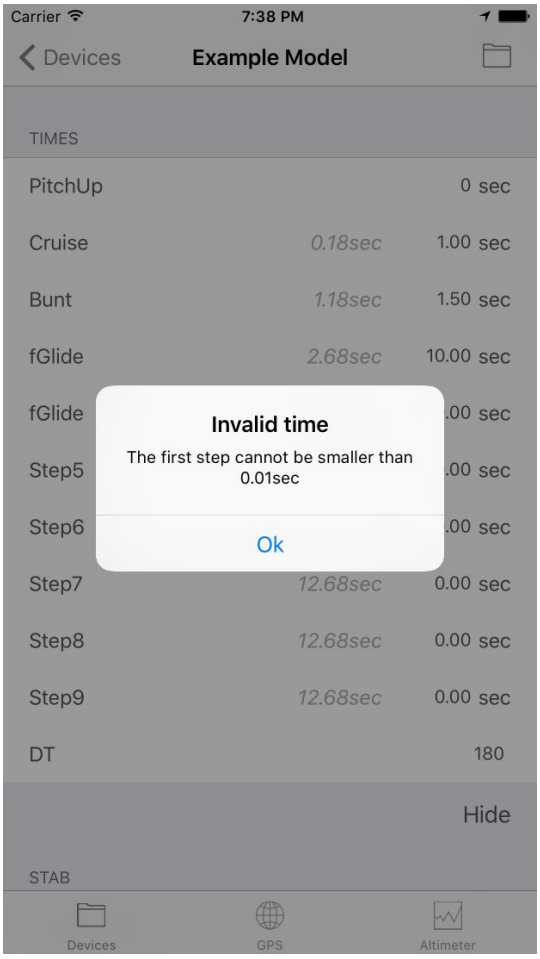
You may now enable one or more additional time steps by entering a non-zero time for them. When you are done, you can hide the remaining disabled time steps with the “Hide” button.

Disabling steps

To disable time steps, you enter a time of 0. A time step with time 0 and any steps following it, will be disabled.



The first step can never be zero, as it would disable the whole program. Therefore, when you try to enter 0 for the first step, you will see an error message:


Carrier
7:38 PM
Devices
Example Model
TIMES
PitchUp
0 sec
Cruise
0.18sec
1.00 sec
Bunt
1.18sec
1.50 sec
fGlide
2.68sec
10.00 sec
fGlide
.00 sec
Step5
.00 sec
Step6
.00 sec
Step7
12.68sec
0.00 sec
Step8
12.68sec
0.00 sec
Step9
12.68sec
0.00 sec
DT
180
Hide
STAB
Invalid time
The first step cannot be smaller than 0.01sec
Ok
Devices
GPS
Altimeter