swiftperformance

tools for testing and training speed

SPEEDLIGHT SYSTEMS

User Manual

User Manual Version 2.0.0

Release Date: 24th April 2018

www.swiftperformance.com

Contents

1. Your SpeedLight System

Welcome to your cutting edge SpeedLight Timing System produced by Swift Performance Equipment. This easy to use technology will deliver precise data for coaches, trainers, and researchers, who are interested in testing and training speed, acceleration, agility, change of direction, and reaction times. Timing data is collected completely wirelessly from your SpeedLight System and is visible in real-time via your iPad through our free SpeedLight Systems application.

1.1 Contents of Your System

At Swift Performance Equipment, we allow our users to pick and choose exactly what SpeedLight devices you need to satisfy your testing and training needs. Therefore, you may have any number of each device listed below (Timing Gates, SpeedStarts, etc.) to build your desired system. You can find some general information about each Swift device below.

Once you receive your system, we ask you to ensure the parts you have received correctly match your order with Swift. If there are any issues, please notify Swift immediately.

1.1.1 SpeedLight Timing Gate

The SpeedLight Timing Gate is a dual-beam timing gate which can be used to collect the start and finish times during a test, as well as any number of splits in between (dependent on how many SpeedLight Timing Gates you have).

For every SpeedLight Timing Gate you receive in your system, you will also receive:

- 1 Timing Gate Reflector Bar
- 2 Tripods (1 for the Timing Gate, and the other for the opposing Reflector Bar)
- 1 Antenna
- SpeedLight Charger (See Section 3 - Charging Your SpeedLight Devices)
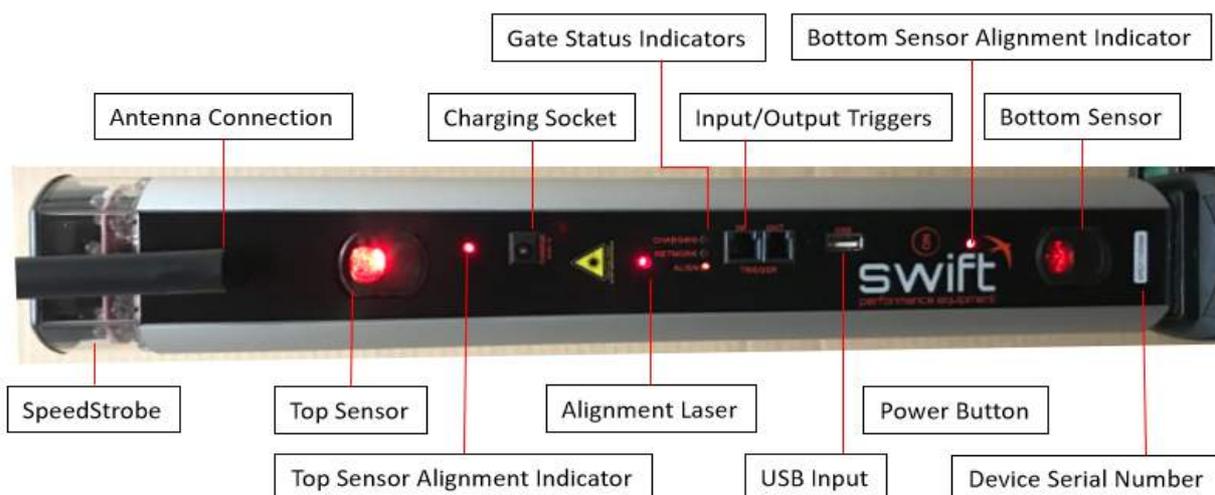
1.1.2 SpeedStart

The SpeedStart is a ground-based timing device used for accurate starting triggers and reaction times during testing, particularly over short acceleration periods such as 5 metres (16 feet). The athlete using this device blocks the laser beam and timing sensor from its

opposing Reflector, with timing triggered when the athlete *leaves* the laser beam. This operates differently than the SpeedLight Timing Gate, where timing is triggered when the athlete *first obstructs* the sensors of the Timing Gate.

For every SpeedStart you receive in your system, you will also receive:

- 1 SpeedStart Reflector Bar (ground-based)
- 1 Antenna
- SpeedLight Charger (See Section 3 - Charging Your SpeedLight Devices)

1.1.3   SpeedReader

The SpeedLight iPad application offers a local database for you to store your athletes and squads to undertake your desired tests. Conventionally with the SpeedLight System, athletes perform their tests in alphabetical order, or the system operator can manually select the desired athlete by tapping the athlete name on the iPad screen at the start of each test.

Alternatively, a SpeedReader device can be used along with a number of SpeedTags (one per athlete) to streamline this process. The SpeedReader utilises RFID technology to identify SpeedTags, a unique silicone bracelet assigned and worn by each athlete.

For every SpeedReader you receive in your system, you will also receive:

- 1 Antenna
- Your requested number of SpeedTags
- 1 Tripod Stand
- 1 SpeedReader Charger (See Section 3 - Charging Your SpeedLight Devices)

1.1.4   SpeedLink

The SpeedLight Timing Gate, SpeedStart, and SpeedReader, all communicate with the SpeedLight iPad app via your SpeedLink. This device is included in every system and can be distinguished by its red silicone casing. It is also possible to use multiple SpeedLinks with your system to run different testing stations in the same location - all at the same time (See Section 4.5 – Operating Multiple Systems Simultaneously)

For every SpeedLink you receive in your system, you will also receive:

- 1 Antenna
- 1 SpeedLink Charger (See Section 3 - Charging Your SpeedLight Devices)
- 1 MicroSD Card and SD Card Adapter

1.1.5   Wi-Fi Access Point

The Wi-Fi Access Point acts as a bridge between the SpeedLink and your iPad. This device sets up a local Wi-Fi network to securely hide your SpeedLink from other wireless devices in the immediate environment such as mobile phones, tablets, laptops, etc. By hiding the SpeedLink from these devices, this allows the SpeedLink to focus purely on its system purpose of communicating with your SpeedLight devices - without the interference external devices can often cause.

All timing systems distributed since 2016 will include at least one Wi-Fi Access Point. By optionally acquiring more than one Wi-Fi Access Point (and multiple SpeedLinks), the user can split the system up over various testing locations to be used independently from each other.

1.1.6 MicroSD Card and SD Card Adapter

A MicroSD Card and SD Card Adapter is included with each system. This MicroSD Card has three uses within your system:

1. Import athletes and squads from your computer to the SpeedLight application on your iPad (see Section 2.5 - Squads),
2. Export athlete and squad results from the SpeedLight application (see Section 2.4.5 – Exporting Athlete Data), and
3. Download available firmware updates for all your devices when available via the SpeedLight application on your iPad (see Section 6 - Updating SpeedLight Device Firmware).

1.1.7 iPad

The SpeedLight Timing System is controlled via the SpeedLight app for iPad only (see Section 2), where the iPad is to be supplied by the customer. The iPad must be running iOS 8.0 or later. Our general rule of thumb, if your model of iPad has a camera on the back of it, it will work with the SpeedLight System.

2.   SpeedLight iPad Application

Search the Apple App Store for '*SpeedLight Systems*' and download our free application to your iPad (the app is also available for iPhone, with limited functionality). Alternatively, if you have a QR Reader application on your iPad you can use the QR code given to the right. The application allows multiple users to import and manage athletes and squads, design custom tests, run your tests, and view and export your results.

Once you have downloaded the application, open the app on your iPad. The app icon on your iPad screen will look like the image to the left. Tap this icon to open the SpeedLight Systems app.

2.1   Coach Login Page

When you first open the SpeedLight Systems application, you will see the '*Coach login*' page. To operate the SpeedLight Timing System, you will need to create at least one coach account.

Tap the orange plus sign ⊕ to create a coach account.
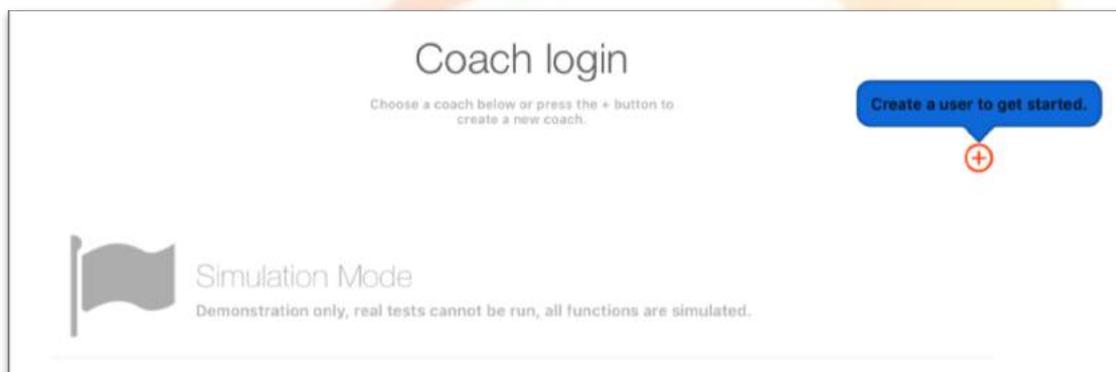
You must enter at a minimum a First Name to create a coach account. You can also include a Last Name, and a photo to represent the coach taken via the iPad camera, or from the iPad photo library.

To delete a created coach, simply swipe left on the coach's name you wish to delete and tap '*Delete*'. Note that deleting a coach will remove all data associated with that coach, including athletes, squads, test designs, and results.

2.1.1   Simulation Mode

The SpeedLight Systems app comes with a '*Simulation Mode*' for demonstration and experimentation purposes. You can select this mode on the '*Coach Login*' page when you open the app.

Simulation Mode features the same design and features that you would see if you entered the app under a created coach's name. However, in Simulation Mode you cannot connect to any SpeedLight devices. The functionality and athlete testing are entirely simulated to allow you to experiment and familiarise yourself with the application, without needing to physically set up the hardware of the system.

2.2   App Navigation

After selecting a created coach account or Simulation Mode, you will be taken to the '*User home*' window. On the left-hand side of the window, you will notice the Navigation Toolbar (see below) which is comprised of seven different options. This toolbar will be visible at all times in the app, after selecting an account, allowing you to navigate throughout the app with ease.

If you find an information bubble ⓘ on a window in the SpeedLight app, you can tap the bubble to bring up additional information in the app itself.
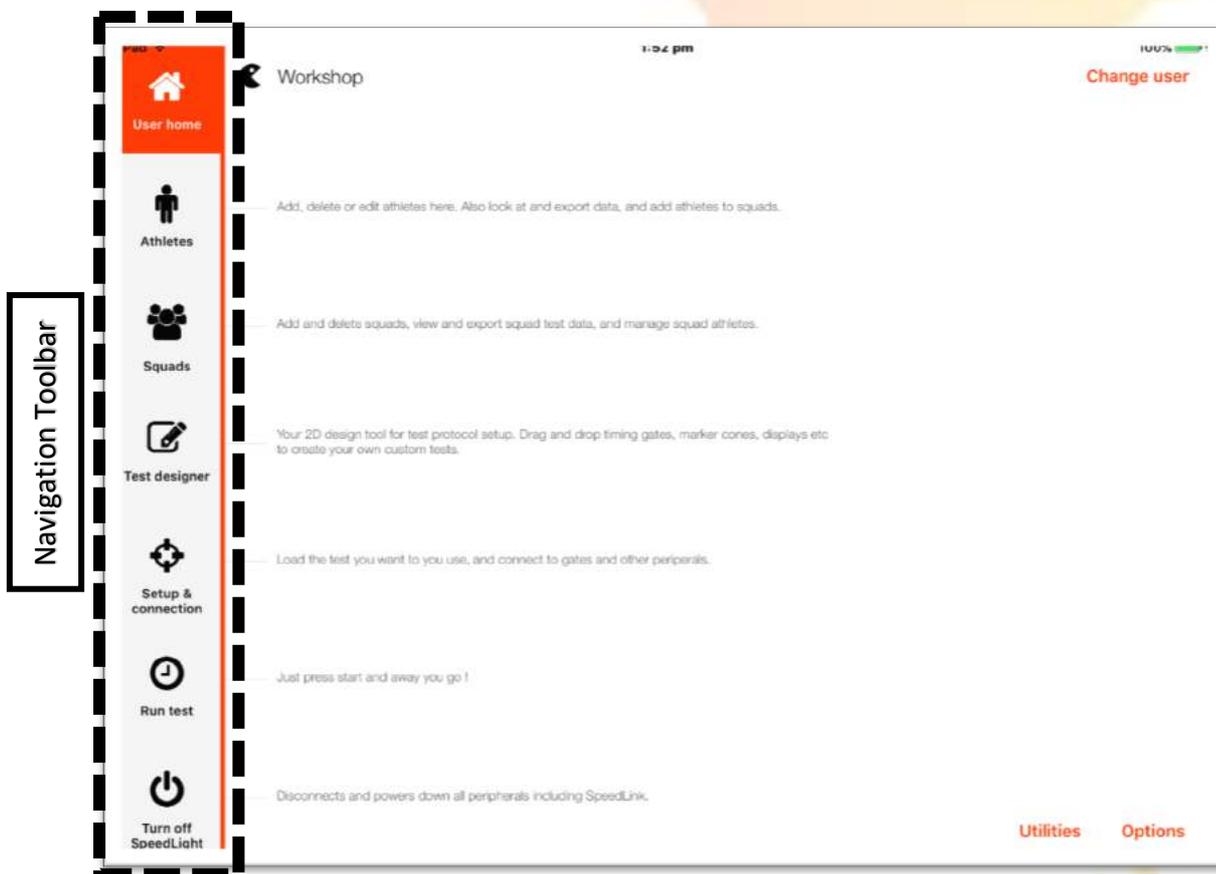
The following sections of this user manual will describe in detail each of the seven options located on the Navigation Toolbar.

2.3   User Home

The '*User home*' window gives a brief introduction to each other option on the Navigation Toolbar. To change the selected coach, or to create a new coach, select '*Change user*' in the top-right corner to return to the '*Coach Login*' page.

In the bottom-right corner, you will see the link titled '*Options*' that will take you to the User options menu. In this pop-up window, you will find a number of settings you can alter to suit your testing requirements. These settings are described below:

- **Measurement units** – design your tests in metres, feet, or yards.
- **Starting** – alter the starting method used for your tests (see Section 2.3.1 – SpeedLight Test Starting Modes below for more detail on each starting method).
- **CSV import delimiter** – Selects whether the athlete import file is comma or pipe delimited. If you are unsure, leave this as the default option of comma delimited.
- **Apple TV display** – with an Apple TV device in the testing area, it is possible to display app data on the screen for all to view. You can select the '*Leaderboard*' option to display a leaderboard for the current test, or the '*Mirror*' option which will mirror the iPad screen to the TV. For more info, visit support.swiftperformance.com and search for the article "Using the Leaderboard".
- **Jump RSI Calculation –** Method of calculating athlete Reactive Strength Index (RSI) which requires a SpeedMat device.
- **Database (Backup Database)** – Back up all data saved in the SpeedLight app and email to a desired address. To restore the backup, open the email on the iPad you wish to install the back up. Tap the attached file and select '*Open in*' → *SpeedLight*. Note this will now override all data previously saved on that iPad with the backup file.
- **Wifi name override** – Leave blank unless instructed otherwise by Swift.
- **SpeedLink IP address override** – If you only have one SpeedLink with an IP address ending in '115' (displayed on front of SpeedLink), you can leave this field blank. Additionally, if you have no sticker on the front of your SpeedLink, leave this field blank. If you have more than one SpeedLink in your system, we differentiate each SpeedLink via a unique serial number shown on the front of the device. If your SpeedLink IP address ends in something other than 115, you will need to enter the full IP address into this field to connect.
- **Decimals to display on 'Run test' page** – change the number of decimal places displayed in test results.
- **Latest firmware versions** – displays the latest available firmware versions for each SpeedLight device. Every time you connect a SpeedLight device to the SpeedLight app it is automatically checked to ensure it has the latest firmware installed.
- **SpeedLink channel (auto or 12-23)** – SpeedLink communication channel. Leave this set to auto unless instructed otherwise by Swift.

2.3.1   SpeedLight Test Starting Modes

There are three different starting modes available for your SpeedLight tests: Normal, Manual 2-stage, and Steady Start. You can select your preferred starting mode via the '*User options*' menu accessed through the '*User home*' page (Section 2.3 – User Home).

- **Normal Starting Mode**
  - When the system is armed, the first Timing Gate of the test will sound its buzzer and green lights will turn on at the top of the Gate. This indicates that

the system is armed and ready to undertake the test. When the athlete passes the first Timing Gate, or leaves the SpeedStart laser beam, timing will start.

- **Manual 2-Stage Starting Mode**
  - o When the iPad user arms the system, both the red and green lights of the first Timing Gate will be lit. When the holder of the iPad believes the athlete is in position and ready, the iPad user taps '*GO*', located at the top of the app screen. The red lights on the first Timing Gate turn off (green lights stay on), and the beeper sounds, triggering the athlete to start their test. Timing starts when the athlete passes the first Timing Gate or leaves the SpeedStart laser beam, not when the coach taps 'GO'.

- **Steady Start Starting Mode**
  - o Steady Start mode requires the athlete to start by blocking the Timing Gate or SpeedStart beam for 3 seconds continuously before the test will begin. When the iPad user arms the system, the red lights on all of the Timing Gates will turn on. The athlete moves into starting position, in between the Timing Gate (or SpeedStart) and its Reflector, causing the red and green lights on all Timing Gates to turn on. After 3 seconds, the buzzer on the first Timing Gate will sound, and only the green lights of this Timing Gate will be lit. This signals the athlete to start their test. Timing begins when the athlete *leaves* the Timing Gate or SpeedStart sensor beam.
  - o Activate '*Reaction Mode*' (*See Section 2.6.3 – Building Your Test*) when designing your test to time how long it takes the athlete to leave the beam from the starting signal (buzzer sounding and green lights on Timing Gate being lit). Reaction Start also adds a random period of time between 0-1 second to the standard 3 second delay, preventing athletes from anticipating the start signal.

2.4   Athletes

All of the athletes entered into the app under the current coach account are stored in the Athletes window. In this window you can add, edit, and delete athletes stored in the app. You can also view individual athlete results, as well as export this data.
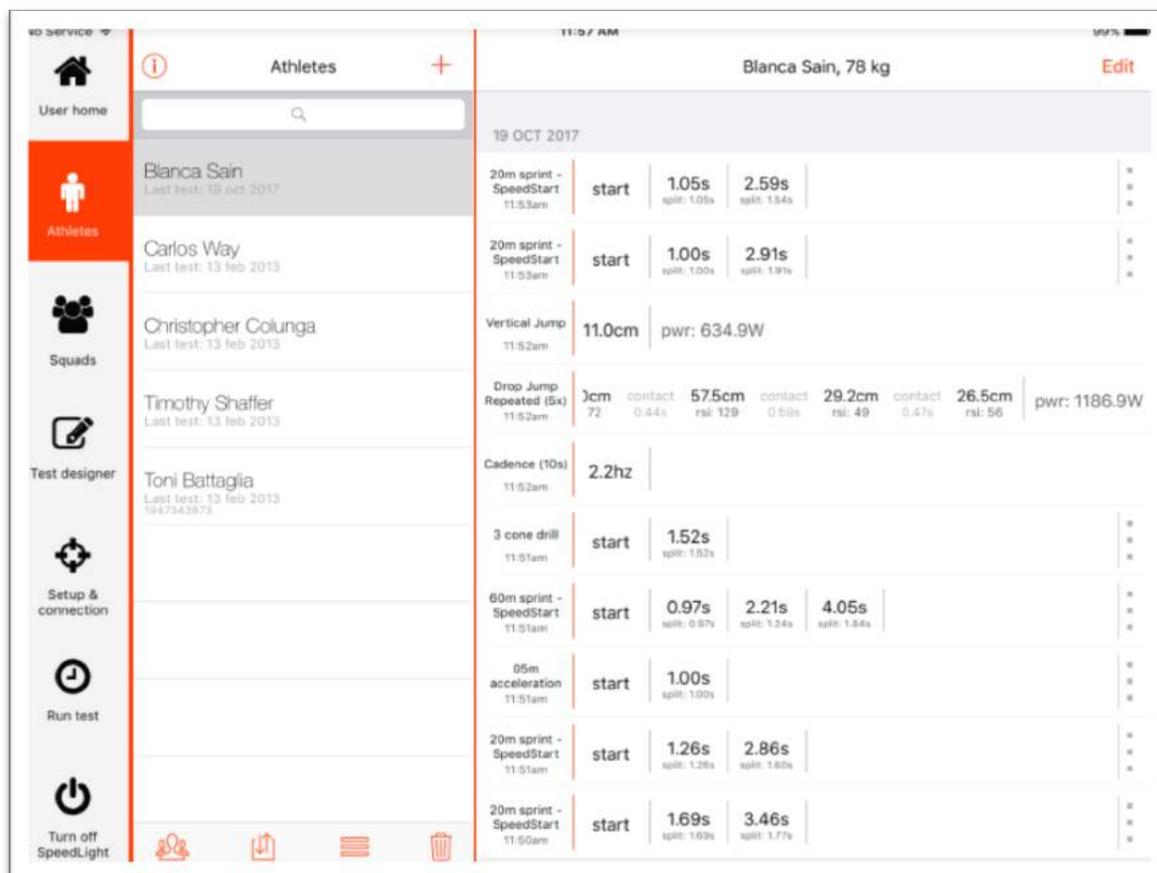
2.4.1   Adding Athletes

You can add athletes into the SpeedLight app by tapping the + at the top of the athlete list and entering in the athlete details. Alternatively, you can import a list of athletes via a CSV file from your computer (can be generated in Microsoft Excel) using the supplied MicroSD card or through iTunes (See Section 2.5.1 - Add a Squad for details on how to do so).

Search for specific athletes via the search bar at the top of the Athlete list.

You can add athletes to created squads via the Athletes window. Simply tap the athlete you wish to assign to a squad, tap the squad button 👥 at the bottom of the athlete list. All created squads will now be visible. Select the squad you wish to assign the athlete to. If you wish to assign multiple athletes to a squad, tap the ☰ button at the bottom of the athlete list and select as many athletes as you wish. Once you have selected the athletes, tap the squad button 👥 at the bottom of the list and select the desired squad.

To calculate *Power* during jump tests on a SpeedMat, the athlete's body weight must be entered under the athlete details in the app.

2.4.2   Editing Athletes

To edit an athlete's details, tap the name of the desired athlete in the athlete list, followed by tapping the Edit button in the top-right corner of the screen.

2.4.3   Deleting Athletes

Delete an athlete(s) by selecting the athlete(s), and then tapping the 🗑 at the bottom of the athlete list. This removes all of the athlete's data permanently from the app. Alternatively you can swipe left on each athlete individually and tap Delete.

2.4.4   View Results

Tap on an athlete to display a history of all recorded tests carried out by this athlete. You can also tap on a test, or multiple tests, to display a graphical representation of the athlete's results.

For example, to the right we have a graphical representation of two simulated 40 metre sprint tests. By tapping two separate tests (shaded on the example image) you can graphically compare each result for instant feedback on the athlete's performance.

2.4.5   Exporting Athlete Data

Select one or more athletes in your athlete list and tap the Import/Export button 📤 at the bottom of the athlete list. Select the destination of your export (email address, SD Card, or other iPad applications), the date range of results you want, and tap Export. The app will now deliver a CSV file to the appropriate destination. Please note to export to SD Card you must have a MicroSD card inserted into the SpeedLink when you select Export.

2.5   Squads

The Squads window allows you to add, edit, and delete squads from the app; while also allowing the coach to view recorded results of athletes in each squad.
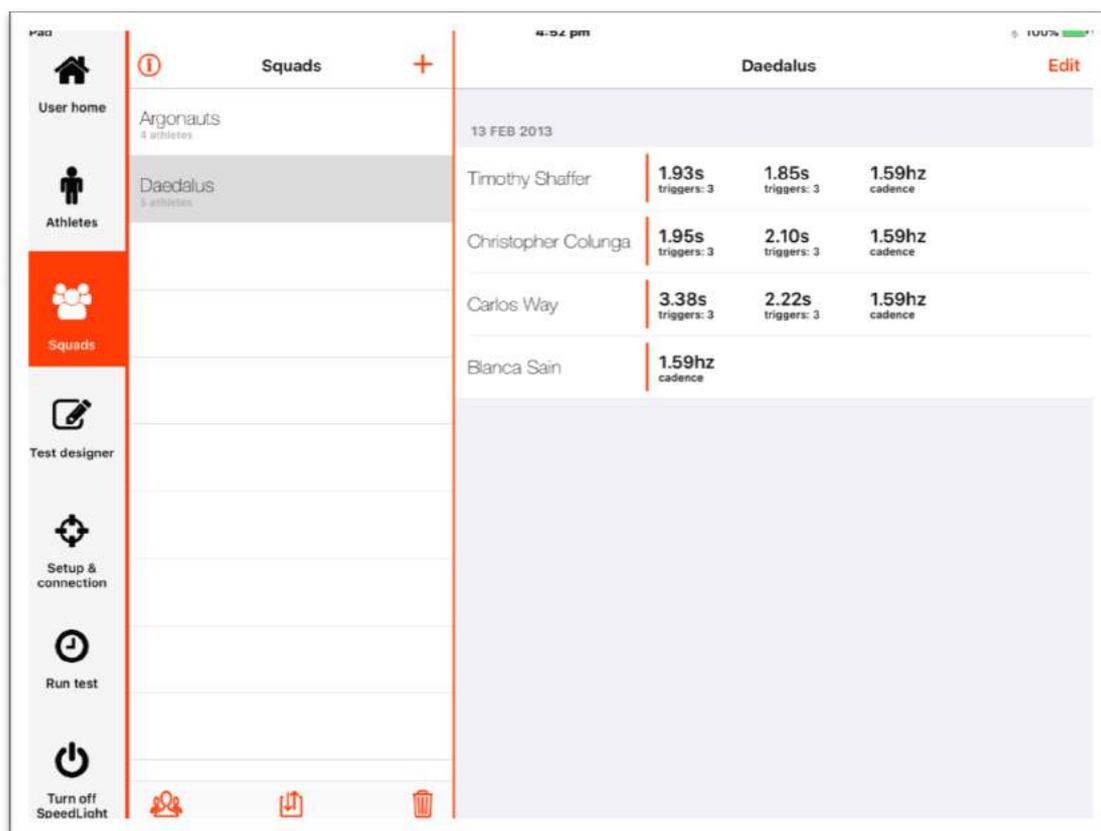
2.5.1   Add a Squad

You can add a Squad to the app by tapping the + at the top of the squad list. Alternatively, you can import squads of athletes via a CSV file from your computer (can be generated in Microsoft Excel) using the supplied MicroSD card or through iTunes.

To import a squad of athletes via a CSV file, follow the procedure below:

1. Visit support.swiftperformance.com and find the article 'How do I import an athlete list into the iPad?'
2. Download the CSV Squad Template file.
3. Open the file (using Microsoft Excel or any other spreadsheet-based applications which can handle CSV files) and populate the list with your athlete details. You may leave UniqueID, Weight, DOB, and Notes fields blank if unnecessary.
4. Save your file in the '.CSV' format. The SpeedLight app uses the name of the file to create a Squad in your SpeedLight database, so keep that in mind when naming your file. For example, if the imported squad was a soccer squad, name the file 'Soccer.csv'.

Now you have your squad file, you have the option of importing the athletes via your MicroSD card and SpeedLink (supplied with your system), or via iTunes. Both methods are described below.

MicroSD Card and SpeedLink

5. Copy the CSV file onto your MicroSD Card and place the MicroSD Card in the designated slot in the front of your SpeedLink.
6. Connect your SpeedLink to the SpeedLight app on your iPad as you normally would (See Section 4 - Turning on your SpeedLight System).
7. In the Athletes tab, select the Import/Export Athletes button 🔼 at the bottom of your screen, and then select 'Import athletes from SD Card' (as seen in the image to the right).

    The app will now import the squad CSV file(s) saved on your MicroSD Card into the SpeedLight app database.

iTunes

4. Open the iTunes program on your PC and connect your iPad via the supplied USB cable. Please note, this procedure was designed using iTunes Version 12.6. Future iTunes releases may differ slightly.
5. Select your iPad via the designated button in the top-left corner of the iTunes window, shown in the image to the right.
6. On the menu shown down the left-hand side of the program, select the *Apps* tab.
7. In the Apps window, scroll down until you find the *File Sharing* section and click on the SpeedLight app.
8. Select *Add File…* and import your saved CSV squad file. Alternatively, you can drag and drop the file into this window.
9. Sync your iPad.
10. Open the SpeedLight application on your iPad and select the Athletes tab from the Navigation Toolbar.
11. Select the Import/Export Athletes button 🔼 and select *Import Athletes from iTunes*.

    The app will now import the CSV file(s) you imported into iTunes into the SpeedLight app database.
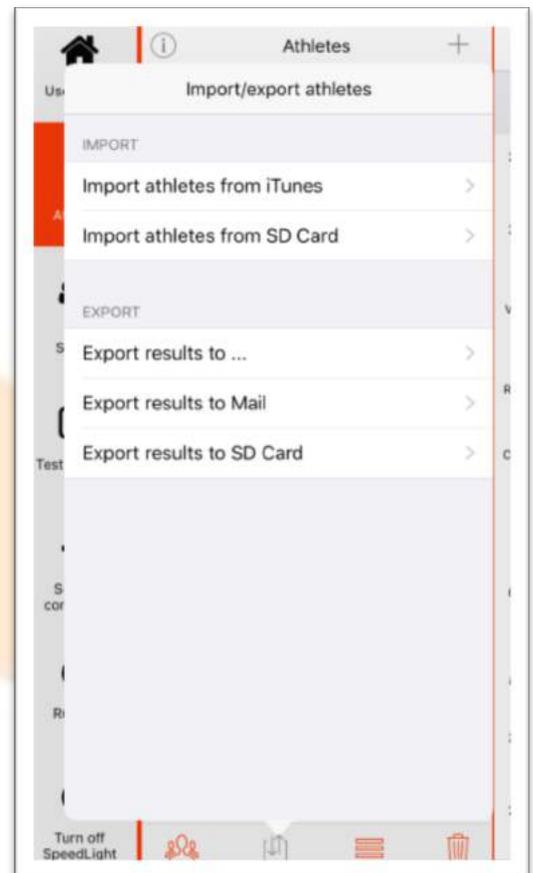
2.5.2   Edit a Squad

Select the squad you wish to edit by tapping on the squad name in the squad list, and then:

- To edit the squad name, photo, or notes, tap Edit in the top-right hand corner of the window.

- To edit the squad members, tap the squad button at the bottom of the squad list. Select each athlete you wish to be assigned to this squad.

2.5.3   Delete a Squad

Select the squad you wish to delete. Tap the delete button at the bottom of the squad list to delete. This only deletes the squad structure itself; all athletes and their data are not deleted and are still visible under the Athletes tab.

2.5.4   View Squad Results

Tap the squad you wish to view. A history of results from athletes within this squad is displayed in the right half of the app window.
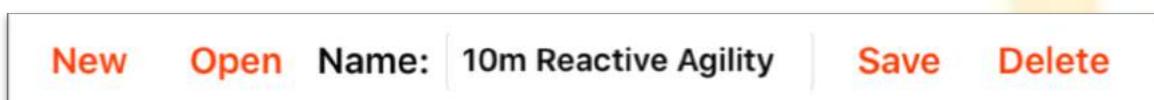
2.6   Test Designer

One of the fundamental features in your SpeedLight Systems app is the 'Test Designer' window. The app comes with a number of predesigned tests divided into three categories: linear, agility, and jump tests. However, the 'Test Designer' tool allows you to create your own unique SpeedLight test designs by simply dragging and dropping SpeedLight devices into their desired positions on the screen. Create brand new tests from scratch, or you can customise one of the many predesigned tests already available in the app.
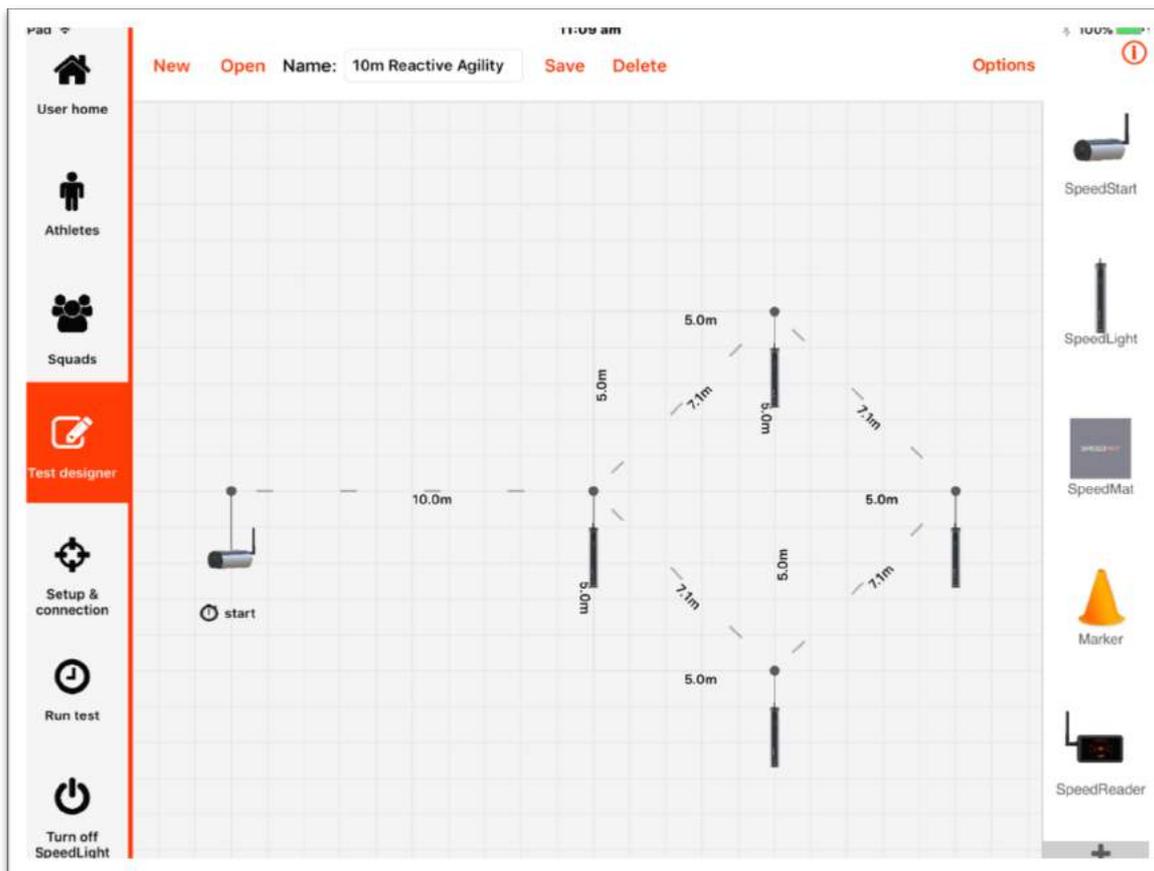
The above image demonstrates the Test Designer window in the SpeedLight Systems app. You can drag any number of devices from the device list on the right side of the window into the central test design area (as is demonstrated in the image above). This example test design requires the athlete to react to a visual stimulus via the Timing Gates to direct his/her path (either left or right) to the finish Timing Gate.

2.6.1   Creating, Editing, and Deleting Tests

Along the top of the Test Designer window, you will see the following toolbar.

Design a new test from scratch by tapping New or open an existing test for editing by tapping Open. Once you have finished with the test design, give the test a Name and ensure that you tap Save. If you do not tap Save, your changes will not carry through to when you wish to run the test. Tap Delete if you wish to remove a user-designed test.

2.6.2 SpeedLight Devices in Test Designer Mode

On the right side of the window you will notice images and text of various SpeedLight devices you are able to utilise in your test designs.

- **SpeedStart** – ground-based starting device. Great for getting reaction times when used in conjunction with a SpeedStrobe on the first Timing Gate.

- **SpeedLight** – SpeedLight Dual-Beam Timing Gate. Can be used for the start and finish of each test, and as many intermediate splits as desired.

- **SpeedMat** – vertical jump measurement device used to measure vertical jump height, power, cadence, and RSI. Older versions of the SpeedMat may require to be connected to a SpeedLight Gate via a supplied cable.

- **Marker –** static device used to demonstrate route deviations in your test. Use the marker to demonstrate the athlete's path between SpeedLight devices to accurately calculate velocity.

- **SpeedReader** – RFID reader used in conjunction with Swift SpeedTags (unique silicone wristband). Place a SpeedReader anywhere in your designed test and assign each athlete a SpeedTag (See Section 4.3.3.4 - Assigning SpeedTags to Athletes). When the athlete is next to perform their test, they tap their unique SpeedTag to the SpeedReader. The app recognises who the athlete is and saves results from the test directly to the correct athlete's history.

Tap the ![+] at the bottom of the bar to show two more devices. These devices have been discontinued but may still be used with the system.

- **SpeedDisplay** – LCD display that can be linked to any active SpeedLight Timing Gate to display a split time.

- **Wired Gate** – represents an earlier model gate which does not have wireless capabilities. These gates can be connected to a new generation wireless SpeedLight gate via cable to communicate with the SpeedLight application. Contact Swift if you'd like more information on this.
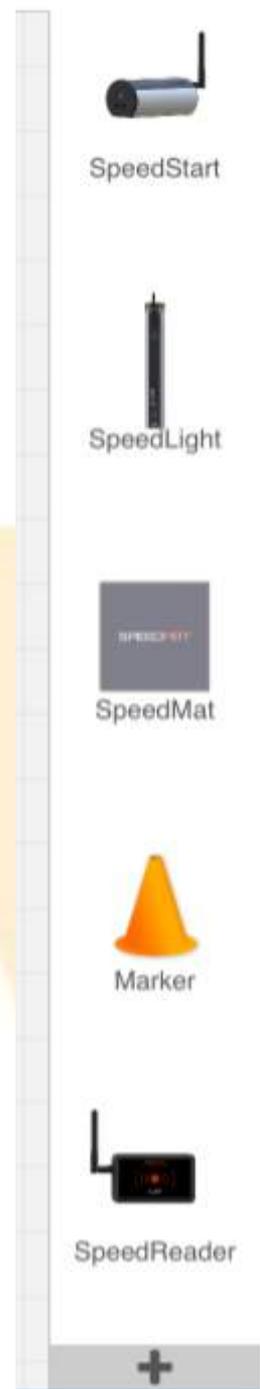
2.6.3 Building Your Test

The SpeedLight Systems app allows you the freedom to design a whole range of performance testing and training exercises. Building your test is as simple as dragging any device from the right-hand margin and dropping them to any location in the central test design area.

The direction of travel during the test will appear as a moving broken line in between devices. By default, the direction of travel is assumed to be the order in which you placed your SpeedLight devices in the test design area. This direction can be modified by using two fingers. Hold one finger on the first gate (origin Gate), and with another finger tap the next gate you wish for the athlete to run to (destination Gate). Carry out this procedure throughout the entire test to indicate the athlete path. Simply repeat the two-finger tap process to delete each path.

Once you have dragged the SpeedLight devices onto the grid, you can tap on each device for additional options:

- Tap the '*Start*' device (either a SpeedStart or SpeedLight Timing Gate) and toggle '*Reaction Start*' on or off. Turning '*Reaction Start*' on will add a random time between 0-1 second as a Reaction Delay. Once the random Reaction Delay has elapsed, the Strobe on the top of the first Timing Gate will light up green and sounds a buzzer to signal the athlete to start.
  - SpeedStart – Time from start signal to when athlete leaves SpeedStart beam is measured as Reaction Time.
  - SpeedLight Timing Gate – In Normal, and Manual 2-Stage starting modes (See Section 2.3.1 – SpeedLight Test Starting Modes), time from start signal to when the athlete first crosses the Timing Gate beam is measured as Reaction Time. In Steady Start mode, the time from the start signal to when the athlete leaves the Timing Gate beam is recorded.
- Tap a SpeedLight Timing Gate to enable specific beams while testing. For running regular sprint tests, we always recommend enabling both beams for greater accuracy; however, if for a certain test in mind you would prefer only needing to break one beam, this option is available to you.
- Let the app know you want multiple splits to be recorded at specific Timing Gates by tapping on the Gate and increasing the Number of Splits.
- Enable 'Random Left or Right' in a 1 Gate test to have the athlete sent either left or right randomly by the app (see Section 2.6.5 – Example Test Designs).
- Tap a SpeedMat to choose what type of jump testing you wish to test.
  - Vertical Jump – athlete begins standing on the SpeedMat and jumps when ready. Alter the number of jumps in the test with the + and – buttons.
  - Drop-jump – athlete begins the test off the SpeedMat. Alter the number of jumps in the test with the + and – buttons.
  - Cadence – Or fast feet, calculates the frequency in which the athlete contacts the SpeedMat over a certain period of time. Alter the time limit with the + and – buttons.

Double tap the test design area to autozoom the screen, or pinch with two fingers to zoom in and out of your test design manually.

If you are using a SpeedReader during your testing, simply drag the SpeedReader icon anywhere in the test area when designing your test.

2.6.4 Test Modes

In the top-right corner of the window, you can select Options to bring up three different test modes.
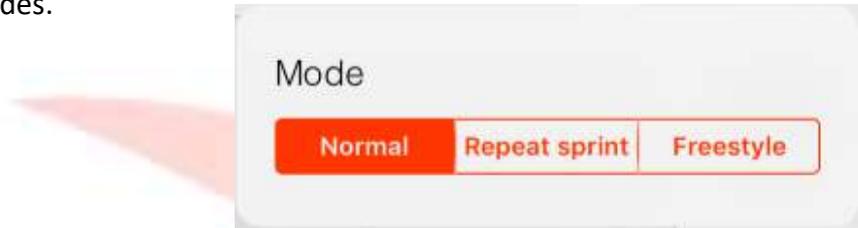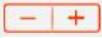

- The **Normal** testing mode carries out your designed test from start to finish in the exact order and direction you have specified in the test design. Once the athlete passes the final Timing Gate in the designed test, the test is complete.
- **Repeat Sprint** directs the athlete back and forth through the designed test a specific number of times, with a specific time interval between each run. Both the number of Repeats and time Interval is customisable. Useful for looking at fatigue in athletes over time.
    - Set the number of times you wish for the athlete to pass through the test by increasing or decreasing the "*Repeats*" field.
    - Change the "*Interval*" field to alter the time taken between tests. The time interval starts when the athlete passes through the *first* SpeedLight Gate in the test.

For example, two SpeedLight Gates 20 metres apart. We want the athlete to run through the test 20 times, with an interval of 10 seconds between each run.

The athlete begins at the 'Start' Gate and the test begins when the athlete passes through that first Gate, meaning the 10 second interval has now also begun. The athlete runs through the '*End*' Timing Gate and the time taken to cover 20 metres is recorded in the app. After 10 seconds total has passed, the test direction has now reversed – the '*Start*' Gate has become the '*End*' Gate, and the '*End*' Gate has now become the '*Start*' Gate. The buzzer on the new '*Start*' Gate will sound, alerting the athlete to repeat the test. The athlete has now completed two Repeats. This process will repeat until the athlete has completed the test 20 times as requested.

In *Normal* and *Repeat Sprint* testing modes, the SpeedLight system is expecting the athlete to pass through the designated path defined in the test design, where the test will finish once the athlete completes the specified path.

- In **Freestyle** mode, there is no specified path given by the app or SpeedLight devices. Instead, every SpeedLight timing device is active and is waiting for the athlete to trigger the device and record a split. Increase the number of splits required by tapping the buttons in the '*Freestyle*' menu. Once the athlete passes through any SpeedLight timing device the specified number of splits, the test is complete.

2.6.5   Example Test Designs

The best way to better understand the Test Designer tool is to experiment. In this section we will take you through a few tests step-by-step to get you feeling more comfortable with the test designer tool.
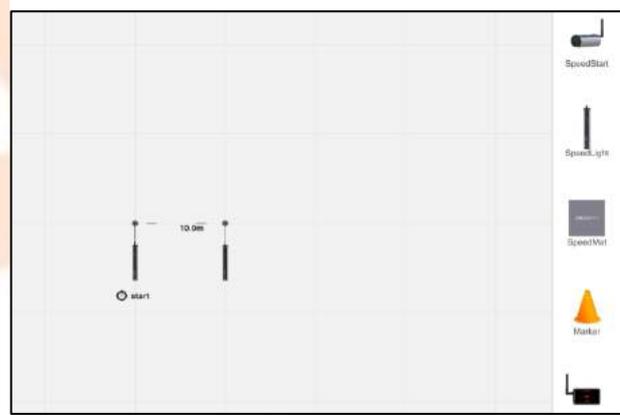
40 Metre Sprint with 4 Timing Gates (0m (start), 10m, 20m, and 40m splits)

Athlete begins at the Start Timing Gate, proceeding in a straight line through the remaining 3 Timing Gates to collect a Starting Trigger, 10m, 20m, and final 40m split.
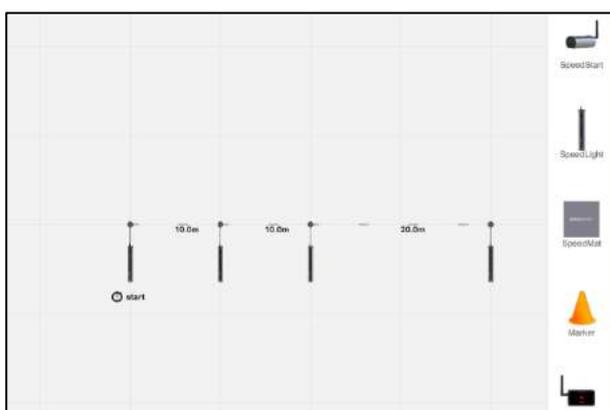
2. Drag one SpeedLight Timing Gate into your test area.
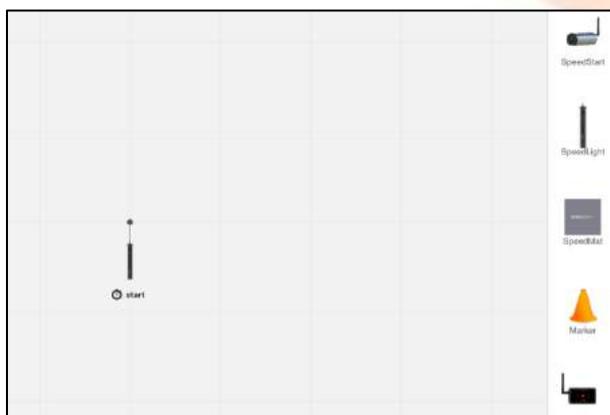
1. Drag a second Timing Gate into your test area, 10m to the right of the first.

3. Drag the third Timing Gate into position, and finally the fourth and final gate.

4. Name your test and tap Save. Simple!

Reactive Agility Test (Y Test) with 4 Timing Gates (45° turn)

Athlete will start at the Start Timing Gate and proceed 10 metres forward, passing through the second Timing Gate. Once the athlete passes through the second Timing Gate, either the left or right Timing Gate will activate for the athlete to pass through (left or right Timing Gate is randomly selected by the app). The athlete will receive an audio and visual signal to direct him/her to the correct Timing Gate.

1. Drag two Timing Gates into positions shown below.
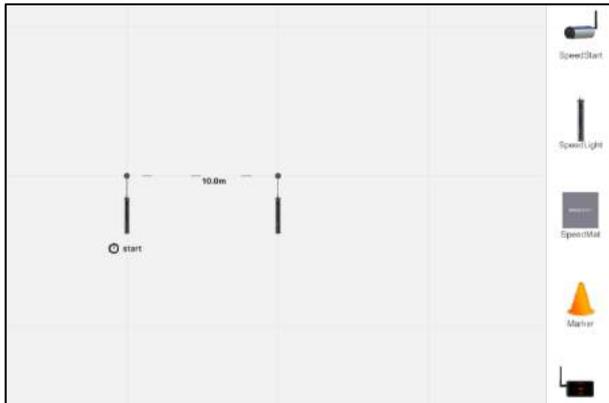
2. Drag a third Timing Gate at a +45° angle to the second Timing Gate.
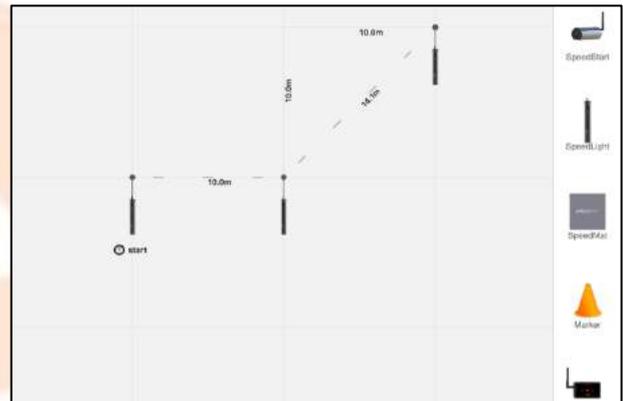
3. Drag a fourth Timing Gate at a -45° angle to the second Timing Gate as shown to the right.
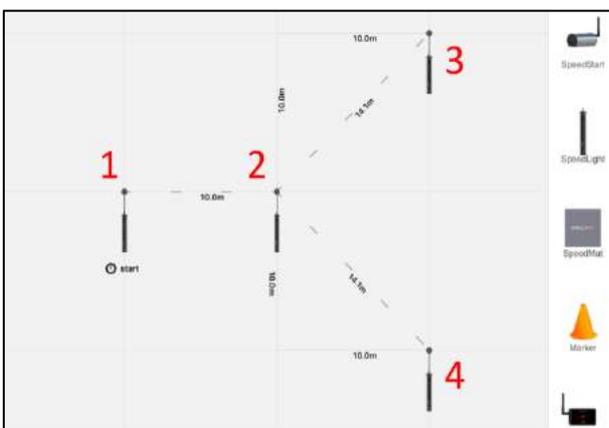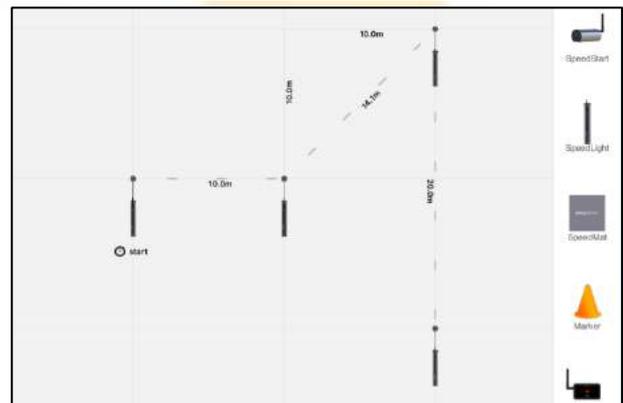
4. Direction of travel must be defined.
   - From Step 3 and looking at the ID numbers given to the left, you can see the path from Timing Gates 1-2-3 is correct, but we need to define path 1-2-4.
   - Hold one finger on Gate 3 and tap Gate 4 to remove this unwanted, autogenerated path.
   - Hold one finger on Gate 2 and tap Gate 4 to create the desired path 1-2-4.

The SpeedLight system will now randomly select path 1-2-3 or path 1-2-4, after the athlete passes through Timing Gate 2. The athlete's acceleration, speed, reaction, and change of direction capabilities will now all be tested in this design.

5-10-5 Pro Agility Test with 1 SpeedStart and 1 Timing Gate (or 1 Timing Gate only) with Reaction Start Activated on Steady Start Mode

Athlete will perform a three-point start facing the Timing Gate, obstructing the SpeedStart beam on the floor with their hand to prepare for the start. Test will be run in '*Steady Start*' mode and '*Reaction Start*' will also be activated. After the starting buzzer sounds, the athlete must move 5 metres to the left to a Marker, 10 metres back to the right passing through the Timing Gate to a second Marker, and finish by moving 5 metres back to the left and finishing the test at the Timing Gate (athlete can also run in opposite direction). In the physical test setup, the SpeedStart and Timing Gate are placed in the same location as seen in the photo to the right. Markers would be placed 5 metres either side of the SpeedStart and Timing Gate.

Designing this drill can seem complicated at first, so let's break it down step-by-step. Remember, the best way to get the most out of the '*Test Designer*' tool is to experiment!

1. First, we need to switch the Starting mode to '*Steady Start*'. Find this in '*User options*' from the '*User home*' window.
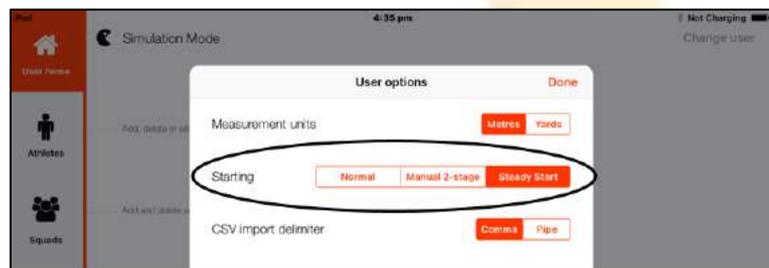
2. To avoid confusion, let's map out each part of the test path linearly. Athlete starts at a SpeedStart, to a Marker (5m), through the Timing Gate (5m) to another Marker (5m), and finally finishing at the same Timing Gate (5m). Replicate the image to the right with the correct measurements.
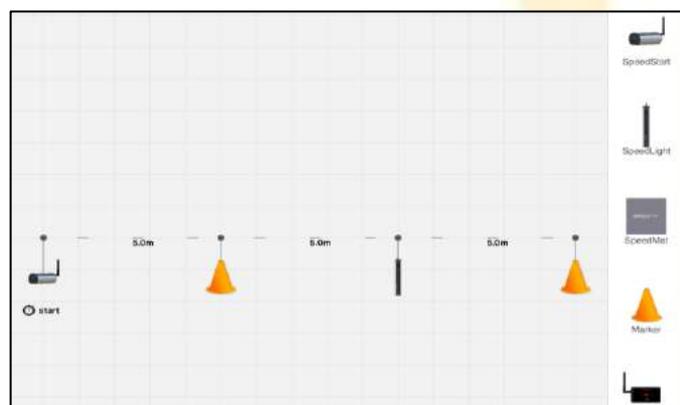
3. As the athlete moves from the final Marker and back to the Timing Gate again, we need to indicate this in the test design. Hold one finger on the final Marker (farthest right in the image in Step 2, and with another finger, tap the Timing Gate. You should now have the dashed line moving in both directions between the final Marker and the Timing Gate.

4. (Right) Now let's rearrange the SpeedLight devices to better represent the physical layout of the test.

   Drag the SpeedStart and drop it on top of the Timing Gate. Your test design area should now look like the image to the right. The broken dashed line should be moving in both directions between the SpeedStart and Timing Gate, and both Markers.
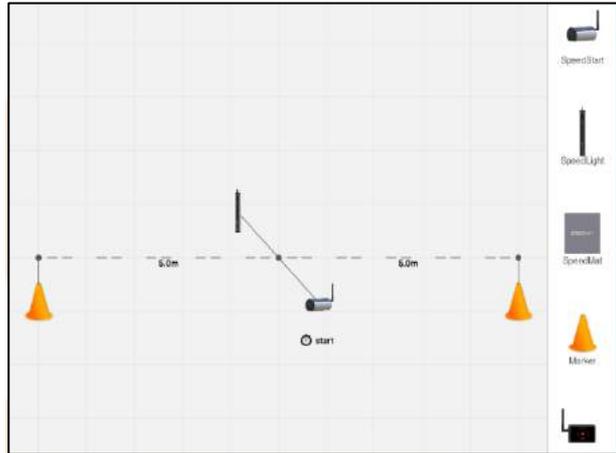

5. (Below) Tap on the SpeedStart in the test design area. Activate *Reaction start*.

6. (Below) Tap on the Timing Gate and increase the *Number of splits* to record (*Repeats*) to 2.
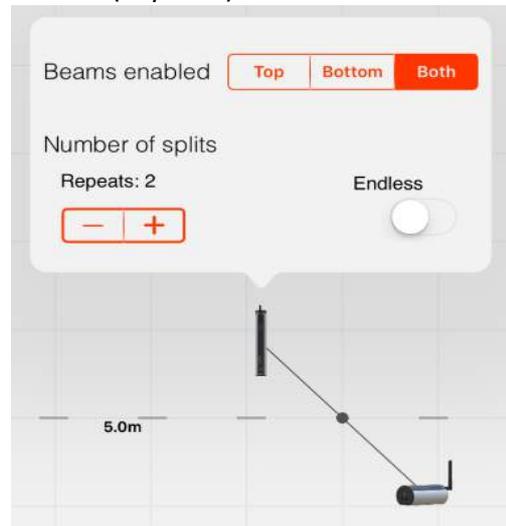
Your 5-10-5 Pro Agility Test is now ready to run. In this particular setup, your athlete will record a reaction time (time taken to leave SpeedStart beam after starting audio-visual trigger by Timing Gate), and two splits from the Timing Gate. You can also run this test without the reactive aspect to it. Simply turn off '*Reaction start*' from the SpeedStart in the test design.

Random Left or Right Drill

In the above example featuring the 5-10-5 Pro Agility Test the athlete is able to decide whether they start running left or right. The *Random Left or Right* feature, found in the '*Test designer*', lets the SpeedLight app randomly decide whether the athlete goes left or right.

This means the athlete must not only be fast in between markers, but must also react to the colour of the lights on the Timing Gate to send him/her left or right.

To do so, we will replicate the same test design as seen in the Pro Agility Test above, however we will remove the SpeedStart. Ensure the direction of travel (shown as the moving broken line) moves from the Timing Gate out to both Markers, and back to the Timing Gate from each Marker as well. Tap on the Timing Gate and increase the Number of Splits to 3 and turn on '*Random Left or Right*'. The Starting Mode must be set to '*Steady Start*'.

- Once the test is armed, the lights on top of the Timing Gate will be red.
- You need to assign a colour to a specific direction, for example red light means the athlete goes left first, and a green light means go right first.
  - This is decided by the user themselves, not assigned in app.
- The athlete moves in between the Timing Gate and its Reflector, and now both the red and green lights will be on to signify the '*Steady Start*' countdown has started (plus random reaction delay if '*Reaction Start*' is enabled.
- The Timing Gate will trigger the athlete by sounding its buzzer, and will be flashing either green or red, signalling for the athlete to move in the correlating direction.

2.7   Setup & Connection

The '*Setup & Connection*' window allows you to select your desired test(s) and squad(s). Most importantly, the wireless communication process with all of your SpeedLight devices begins on this window. Here you are able to connect to your SpeedLight devices and view the status of each device.

If you wish to view this page without any hardware connected, you will need to run the app in '*Simulation Mode*' (found on '*Coach Login*' page).

For information on connecting your SpeedLight devices, see Section 4 – Turning on your SpeedLight System.
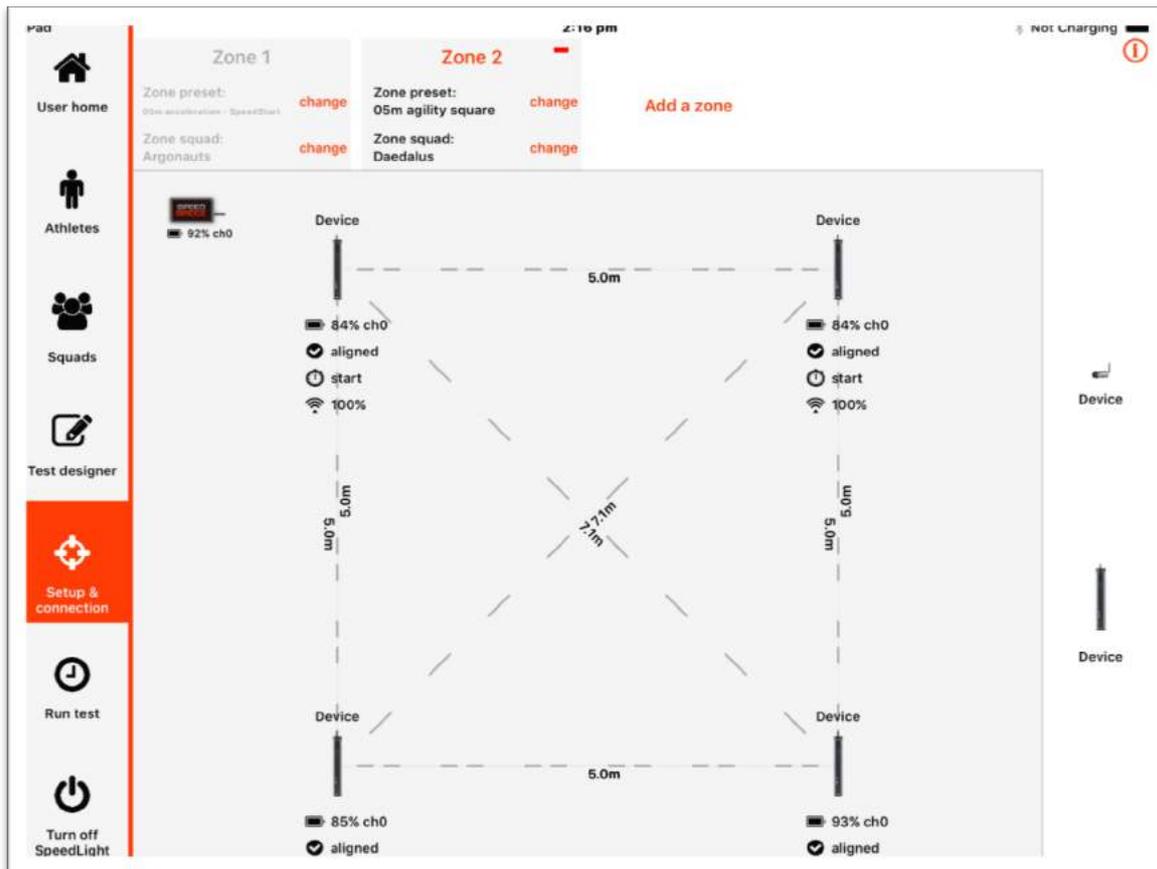
2.7.1 Setting Test Zones

SpeedLight allows you to run up to four different test zones concurrently – all through the one iPad. By default, only one zone is present when you open the Setup & Connection window, which you can see along the top of the screen. To add more zones, simply tap Add a zone, up to four zones in total.

Each zone is completely independent of each other. Therefore, you can select up to four different zones, with four different tests, with four different squads, all running at the same time through just the one iPad!

In each zone, you can select your desired test via the '*Zone preset*' option. Tap change next to '*Zone preset*' and a number of tests will appear including predesigned linear, agility, and jump style tests, as well as your custom-built tests build in the Test Designer (custom tests are located at the bottom of the list in alphabetical order).

To select a squad for each zone, simply tap change located next to '*Zone squad*', and a list of your saved squads will appear. Simply select your desired squad for testing in this zone. If you do not select a squad, the entire list of Athletes saved under the current user will appear when running the test.

For example, in the previous image, we are running two separate zones with two different squads. In Zone 1, the *Argonauts* squad are running a *05m acceleration + SpeedStart* test; while at the same time in Zone 2, the *Daedalus* squad are undertaking a *05m agility square* exercise.

2.7.2   SpeedLight Device Representation

This section describes the iPad application appearance only of the Setup & Connection page including connected devices. For information on physically connecting SpeedLight devices to the SpeedLight System, see Section 4 – Turning on your SpeedLight System.

SpeedLight devices wirelessly connected to the SpeedLight app will appear on the right-side margin of the '*Setup & Connection*' window. After selecting your desired test in one of the four zones, a shaded representation of your test will appear in the central test area. Simply drag your connected SpeedLight devices into position on your test.

Once the SpeedLight devices have been dropped into position, you will be able to see some important status information for each device. This includes:

- Battery Percentage – This percentage value represents the amount of battery left in your SpeedLight device.
- Alignment – If the SpeedLight Timing Gate is correctly aligned with its Reflector, it will indicate the status of '*aligned*'. If the device is not aligned, the app will indicate a status for this device of '*not aligned*'.
- Signal Strength – The signal strength between your SpeedLink and each SpeedLight device.

Additionally, in the top-left corner of your test area, you will see a small black box named SpeedBridge. This represents your SpeedLink, with its remaining battery percentage.

2.8   Run Test

After setting up your test in '*Setup & Connection*' and positioning the required SpeedLight devices in your test, you can now move to the Run Test window to undertake your testing.
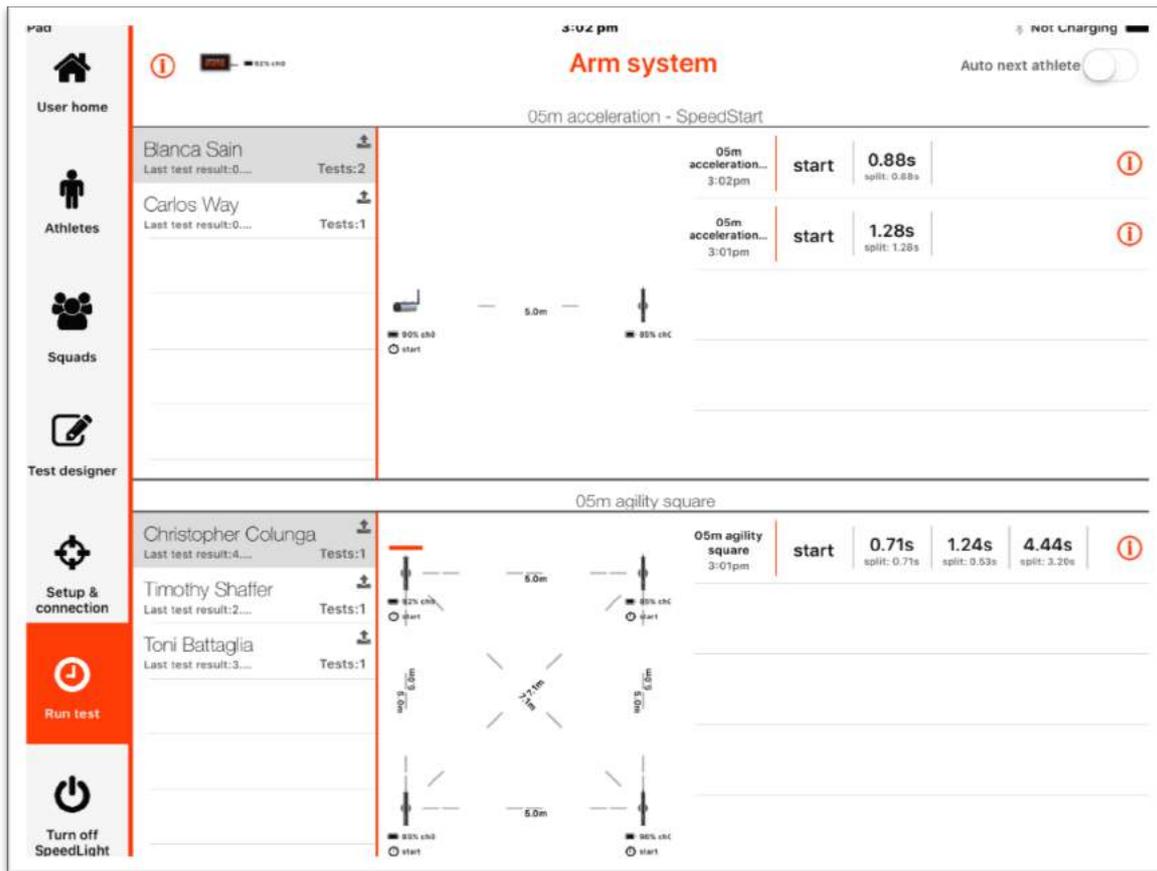
On this window, you can see the tests and specified squads that were selected in *Section 2.7 - Setup & Connection*. Here we can see the next athlete in each squad to be tested by the shaded Athlete name, and a history of their results on the right side of their zone window.

To initiate the system to start testing, tap Arm system at the top of the window. By tapping Arm system, the system will record the test results in real-time as the athlete passes through the course. Once the athlete finishes the course, the system disarms itself as it has finished testing. If you have multiple athletes you wish to test, you can turn on *Auto next athlete* located in the top-right corner of the screen. With this function enabled, the SpeedLight system will automatically cycle through each athlete as they complete their individual tests – no iPad user action required. The most recent result for each athlete will be located at the top of their results history.

2.9   Turn off SpeedLight

The final window accessible from the Navigation Toolbar is used simply to shut down your SpeedLight System via the application. Enter the '*Turn off SpeedLight*' window, and tap Confirm shutdown to power down all SpeedLight devices EXCEPT your Wi-Fi Access Point. Your Wi-Fi Access Point has a physical switch which needs to be shut down manually.
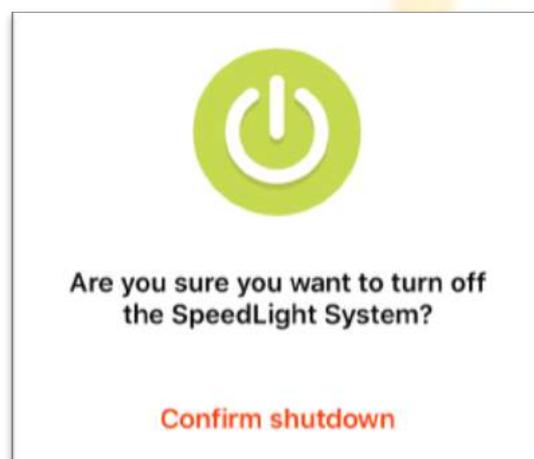
3.   Charging Your SpeedLight Devices

Your SpeedLight Timing System is completely wireless, with each device housing its own Lithium Polymer battery to function. It is strongly recommended you charge each device prior to using it for each testing session. Each device is equipped with smart charging technology and cannot be overcharged.

	Charger Type	Charging Time[1]	Battery Life[2]
Timing Gate	SpeedLight Charger	2 hours	7 hours
SpeedStart	SpeedLight Charger	2 hours	7 hours
SpeedReader	Mini USB Charger	4 hours	7 hours
SpeedLink	Mini USB Charger	4 hours	6 hours
Wi-Fi Access Point	Micro USB Charger	4 hours	24 hours

1. Charging times are estimates only and represent charge time for a fully flat battery to reach full charge. Each device is equipped with smart charging technology and cannot be overcharged, therefore leaving the device on charge for an extended period of time will not harm your device.

2. Slight variations with your devices may occur with your system. The length of time given in this table represents a minimum time your device will last for with a fully charged, healthy battery. This value may vary over the life of your SpeedLight device.

Do not use other device chargers that have not been supplied by Swift Performance Equipment.

If you're planning on storing your system for a few weeks or more, try to ensure the SpeedLight devices are at least at 50% battery. Storing Lithium Polymer batteries below this level for extended periods of time can lead to a reduction in battery capacity.

Details of how to charge each device can be found below.

3.1   SpeedLight Timing Gates and SpeedStart

The SpeedLight Timing Gates and SpeedStarts are charged via the same charger referred to in this manual as a '*SpeedLight Charger*' (included in supplied system). This charger (pictured below) is shipped in three separate parts: Wall Adapter (with your national plug type), 19V AC Adapter, and X5 Cable (daisy chain). The SpeedLight Charger included in your system may slightly differ visually than what you see below but performs the same function. Connect the three parts of the charger as shown in the image below.

A   **B**   **C**
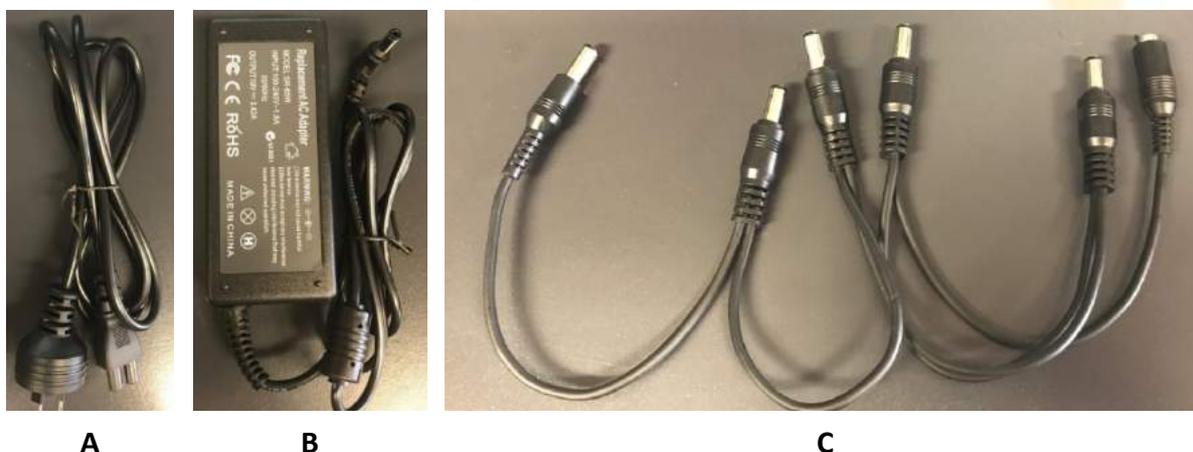
This charger can charge up to a total of five Timing Gates and SpeedStarts at once. If the number of Timing Gates and SpeedStarts in your system exceeds five, you will have an additional charger(s) supplied with your system to allow simultaneous charging of all Timing Gates and SpeedStarts.

To charge, insert powered charger into each of your Timing Gates and SpeedStarts as shown in the images below. The red Charging light on each device will illuminate when the device is charging. Once the device has a full battery, the red charging light will turn off.

3.2   SpeedLink and SpeedReader

A Mini USB charger is used to charge both the SpeedLink and SpeedReader devices (one charger supplied per device).

Insert the Mini USB cable into the designated Mini USB slot on the front plate of each device (see right). The red status light on each device will turn on while charging and will turn off when the battery has been fully charged.

3.3   Wi-Fi Access Point

Dependent on when you acquired your system, you may have one of two varying models: the TripMate Titan, or D-Link DIR-510L. Both devices perform the exact same role within the SpeedLight system and both are charged via a Micro USB charger (supplied).

3.3.1   TripMate Titan

To charge, simply insert the Micro USB cable into the designated Micro USB socket as shown to the right. The Micro USB socket can be found by lifting the rubber protective cover near the top of the device. The Micro USB socket is labelled on the device as *INPUT*.

On the top of the device you will notice 4 white lights in an arc signalling the device battery level. The device is fully charged when all 4 white lights are lit solid. You can also check the battery level of the device, while not on charge, by a quick tap of the power button on top of the device (less than one second).

3.3.2   D-Link DIR-510L

To charge, simply insert the Micro USB cable into the designated Micro USB socket as shown on the right. The Micro USB socket can be found at the base of the device near the *INTERNET* socket and is labelled as *DC IN 5V*.

While charging, you will see a red, orange, or green light on the side of the device. A red light indicates very low battery, orange a medium charged battery, while green represents an almost fully charged battery. This light will turn off once the battery is fully charged.

While charging, ensure the power switch on top of the device is set in the *OFF* position, **NOT** in *CHARGER* mode.

4. Turning on Your SpeedLight System

4.1 System Preparation

Before turning on any SpeedLight devices:

- Ensure all SpeedLight devices and iPads are charged.
- Place all utilised Timing Gates, Reflectors, and SpeedReaders, into a Tripod. Adjust knobs and handle of Tripod heads to secure and stabilise.
- Attach an antenna to all Timing Gates, SpeedStarts, SpeedReaders, and SpeedLinks. Ensure the antenna is pointing towards the sky.

4.2 Placing Your Devices in the Field

There are number of tips listed below to get the best out of each SpeedLight device by proper positioning. Please read these tips before setting up your system, as they will help ensure strong communication paths between devices to maintain optimum system performance.

In general, the communication paths between devices and their respective maximum distances can be seen in the image below.
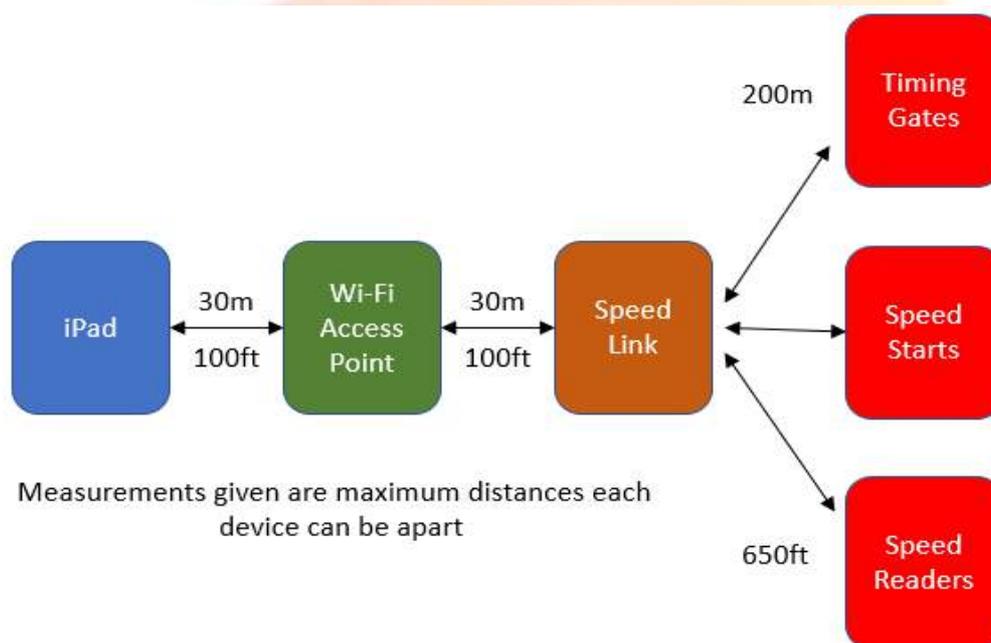
As well as not exceeding these specified distances above, for optimum communication it is important a minimum distance is observed as well. It is recommended no device sits within 40cm (16") of another.

4.2.1 SpeedLink, Wi-Fi Access Point, and iPad Positioning

These three devices all communicate together via Wi-Fi, with a range of roughly 30 metres (100 feet). If the user is holding the iPad in their hands while testing, ensure they do not move further than 30 metres from the Wi-Fi Access Point.

Additionally, the iPad, Wi-Fi Access Point, and SpeedLink, should NEVER be placed on the ground. The simplest way to adhere to these recommendations is to sit your SpeedLink and Wi-Fi Access Point in opposing corners on top of your SpeedLight Carry Case.

4.2.2   Other SpeedLight Device Positioning

The other SpeedLight devices in your system which may include Timing Gates, SpeedStarts, and SpeedReaders, all communicate directly to your SpeedLink via XBee. This allows these devices to be placed up to 200 metres (or 650 feet) from your SpeedLink device.

4.3   Connecting Your System

It is very important that you follow this procedure in this order each time you wish to set up your system. If this procedure is not followed, you may face issues running your SpeedLight System.

4.3.1   Connecting to Wi-Fi Access Point

If you do not have a Wi-Fi Access Point, proceed to Section 4.3.2.1 – No Wi-Fi Access Point.

a. Turn on your Wi-Fi Access Point by holding the Power button on top of the device down until all 4 white lights on top of the device are lit solid, and release. A blue light on top of the device will also be lit and will begin flashing after a few seconds. Wait for approximately 30 seconds, or until this blue light stops flashing and is lit solid.

    i. If you are using a D-Link DIR-510L Access Point (white rectangular box), move the switch to the ON position. You will see two lights on the side of your device, one representing the Battery level, and the other representing the Access Point Status demonstrated by the image ⏻. Wait until the Status light turns green.

b. On your iPad, go to Settings → Wi-Fi and connect to the network '*SpeedLAN_X*' created by your Wi-Fi Access Point (see below). Wait for the blue tick to appear next to the network name to signify successful Wi-Fi connection.

The default password is: speedlight
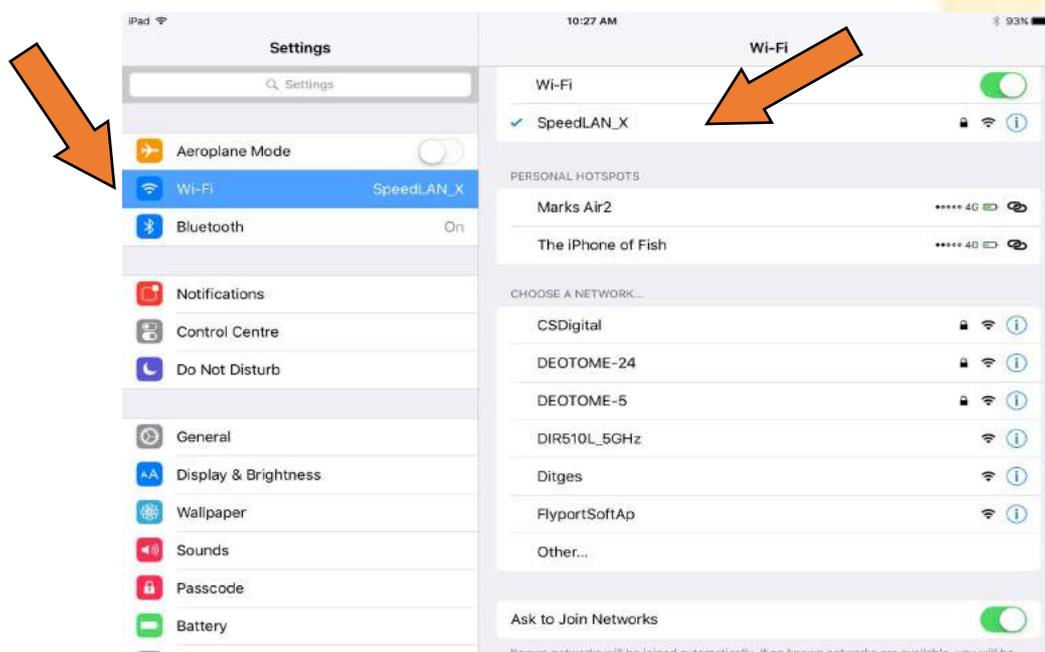
4.3.2 Connecting to SpeedLink

a. Turn on the SpeedLink by holding down the red '*on-off*' button until the red '*status*' light turns on solid, and release. Wait for approximately 40 seconds for the SpeedLink to automatically find and connect to the Wi-Fi Access Point.

b. Open the SpeedLight application on your iPad.

c. Select your account or add yourself as a user.

On the front of your SpeedLink, you should see a white printed sticker with an SSID and IP Address listed.

If your IP is: 192.168.1.115, skip to Step *h*.
If there is no sticker present, skip to Step *h*.
If your IP is any other value, proceed to Step *d*.

d. In the top-left corner of the app, select '*User Home*' (refer to following image).

e. In the bottom-right corner, select '*Options*' (refer to following image).
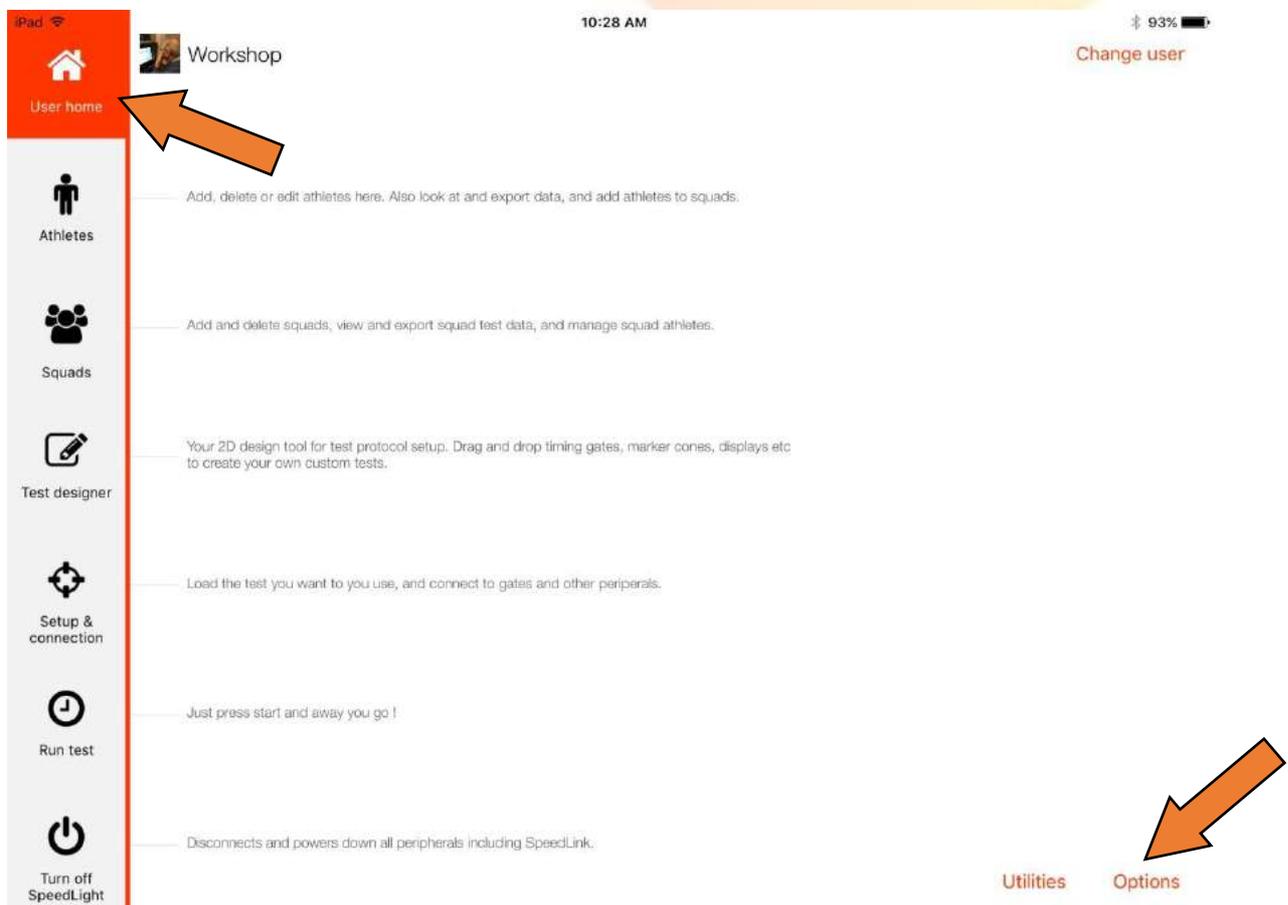
f. Scroll down the '*Options*' menu to the field '*SpeedLink ip address override*'. Enter the IP address listed on the front of your SpeedLink **exactly** (refer to following image).

g. Select '*Done*'.
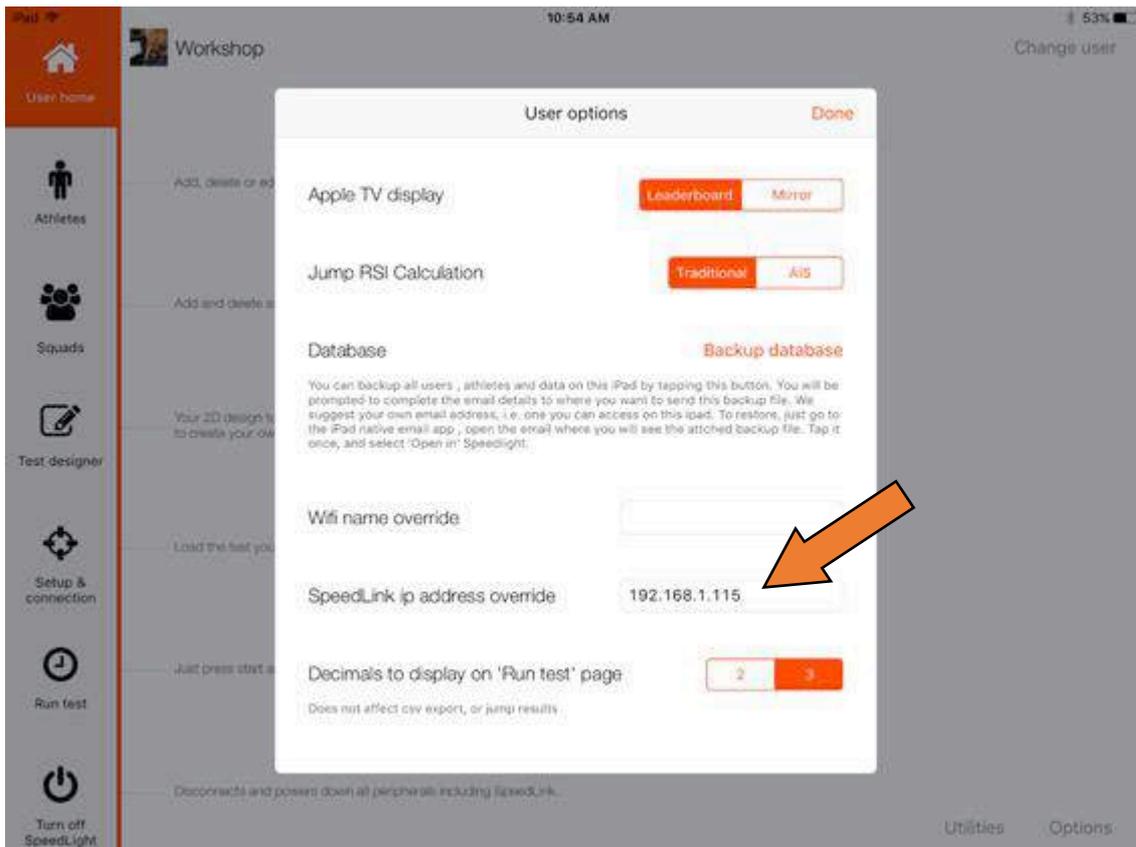
h. On the Navigation Toolbar (left margin), select '*Setup & connection*'.

The app will now connect to the SpeedLink via the Wi-Fi Access Point.

4.3.2.1 No Wi-Fi Access Point in System

Some older systems may not have included a Wi-Fi Access Point when you acquired the system. If you do not have a Wi-Fi Access Point and have experienced Wi-Fi network dropouts, you should consider adding one to your system to help stabilise and secure your Wi-Fi connection. We recommend all SpeedLight users to be using a Wi-Fi Access Point in their system. Contact Swift if you would like more information.

The setup procedure is slightly different for those without a Wi-Fi Access Point and can be found below.

a. Turn on the SpeedLink by holding down the red '*on-off*' button until the red '*status*' light turns on solid, and release. Wait for approximately 20 seconds for the SpeedLink to automatically generate its own Wi-Fi network. This network will have the name '*SpeedLink_nnnnn*', where '*nnnnn*' is equal to the last 5 digits of your SpeedLink serial number (found on the front of your SpeedLink).

b. On your iPad, go to Settings → Wi-Fi and connect to the network '*SpeedLink_nnnnn*' created by your SpeedLink.

The password for your SpeedLink Wi-Fi network is equal to the last 5 digits of the SpeedLink serial number.

Wait for the blue tick to appear next to the network name to signify successful Wi-Fi connection.

c. Open the SpeedLight application on your iPad.
d. Select your account or add yourself as a user.
e. On the Navigation Toolbar (left margin), select '*Setup & connection*'.

The app will now connect to the SpeedLink via the Wi-Fi Access Point.

4.3.3 Connecting to SpeedLight Timing Devices

Now that you have successfully connected to your SpeedLink via your Wi-Fi Access Point, you can select your desired test and squad from the top bar of your app screen (See Section 2.7.1 – Setting Test Zones). After selecting your test, you will see a shaded representation of its layout in the central Test Area. It's now time to turn on your SpeedLight devices to fill your selected test setup.

Ensure you are now on the '*Setup & connection*' page in the SpeedLight app. You *must* be on this page for communication between your SpeedLink and other SpeedLight devices to occur.

4.3.3.1 SpeedLight Timing Gate

Turn on your SpeedLight Timing Gate by pressing the ON button on the front of the gate. The Timing Gate will now connect to your SpeedLink within 20 seconds and appear in the right-hand margin of the SpeedLight app on your iPad.

Place your Timing Gates and their opposing Reflector in the desired locations in the field. Splits are recorded by athletes when they obstruct the Timing Gate sensor beams from its opposing Reflector, so keep this in mind when positioning your devices in the field. The Timing Gate and Reflector can be as far as 6 metres (20 feet) apart from each other to function successfully.

Keep in mind the average heights of the athletes, as well as which body part you wish to trigger the split. Adjust the Tripod height accordingly. For instance, testing a team of young kids would be different in height compared to a team of professional basketballers. Additionally, if starting your test with a Timing Gate, starting position must be taken into consideration. For example, if starting from a crouch or 3-point start, the Timing Gate and Reflector should be lowered to ensure the athlete does not pass under the sensor beams while starting from a low position.

Tighten the knobs near the top of the Tripod to secure the SpeedLight device. Note that the adjustment handle on the Tripod must also be tightened by twisting the handle clockwise to secure the Tripod into position.

From the moment you turn the Timing Gate on, the device will be checking its alignment with its opposing Reflector bar. To aid the user with alignment, you will notice a laser beam shining from the front of the Timing Gate. Aim this laser beam at the target of one of your Reflector Bars to align your device. The Timing Gate will alert the user that is not aligned by turning on the red lights on top of the Timing Gate, and by beeping:

- No beeps = aligned,
- 1 beep = top sensor not aligned,
- 2 beeps = bottom sensor not aligned,
- 3 beeps = both sensors not aligned.

You can also tap on the Timing Gate in the app to sound its buzzer. This can help you identify each Timing Gate when in the field.

4.3.3.2 SpeedStart

Turn on your SpeedStart by pressing the ON button. The SpeedStart will now connect to your SpeedLink within 20 seconds and appear in the right-hand margin of the SpeedLight app on your iPad.

When the SpeedStart is powered on and connected to the SpeedLight app, a red laser line generator will shine from the front of the device. Place the SpeedStart on the ground and aim the red laser at the opposing SpeedStart Reflector. The SpeedStart can be placed up to 2 metres (6 foot) from its opposing Reflector.

As the SpeedStart is a ground-based device, long grass or uneven surfaces may cause issues with alignment. The SpeedStart operates by sending a beam of light to the opposing Reflector, which reflects back to the SpeedStart. If this beam of light does not reach the Reflector due to uneven ground or an object other than the athlete in the beam's path, the device will not detect the athlete entering or leaving the beam.

When your timing system is armed and a SpeedStart is included in your test, your SpeedStart will make no sound if it is aligned with its Reflector. If the device is not aligned with a Reflector, the SpeedStart will emit a constant beep. Ensure before starting your test there is no beep from your SpeedStart while the athlete *is not* obstructing the beam, and a constant beep is emitted when the athlete *is* obstructing the beam.

4.3.3.4 SpeedReader

To turn on the SpeedReader, hold down the red '*on/*off' button for 3 seconds, or until the red 'status' light turns on solid (like turning on your SpeedLink). The SpeedReader will now connect to your SpeedLink within 20 seconds and appear in the right-hand margin of the SpeedLight app on your iPad.

Place the SpeedReader and its Tripod near the Start SpeedLight device (SpeedStart or Timing Gate). The athlete must tap their SpeedTag *before* they begin their test to successfully identify the athlete.

Assigning SpeedTags to Athletes

If you are using a SpeedReader in your test, you must first assign each unique SpeedTag to a certain Athlete in your system. This process involves a small investment in time prior to testing that will help streamline your testing session. This is particularly useful for large groups in ensuring nobody runs accidentally under another Athlete's name.

a. Add your Athletes to the SpeedLight app individually (see Section 2.4 – Athletes) or import multiple Athletes in a Squad (see Section 2.5 – Squads).
b. Follow the instructions in Section 4.3 – Connecting Your System to connect your SpeedReader to the SpeedLight app. Ensure the SpeedReader appears in the right-hand margin of the Setup & Connection page.
c. On the Navigation Toolbar, select the Athletes tab.
d. In the app, select the Athlete from the Athlete database you wish to assign a SpeedTag to.
e. Tap the SpeedTag to the centre of the target on the SpeedReader. You will see a notification pop up on the app screen to let you know the SpeedTag has been successfully assigned to the selected Athlete. The green light on the SpeedReader will also flash when a SpeedTag is recognised.
f. Repeat steps d-e for each of your Athletes.
g. When running your tests, ensure each Athlete touches their SpeedTag to the SpeedReader *before* starting each test.

4.4   Placing the SpeedLight Devices in App

With your finger, drag each SpeedLight device from the right-hand margin into its correct position on your selected test design.

Remember, you can tap on each Timing Gate displayed in the app to sound its buzzer. This can help you determine which Timing Gate is which when placing them in the field.

Once you have placed the SpeedLight devices in their positions, you can hold your finger on any device to bring up a dialogue box which allows you to rename it. By default, the name of each device is related to its serial number. For example, you may wish to name your Timing Gates by their position in the course, such as *Start*, *10m*, *20m*, etc.
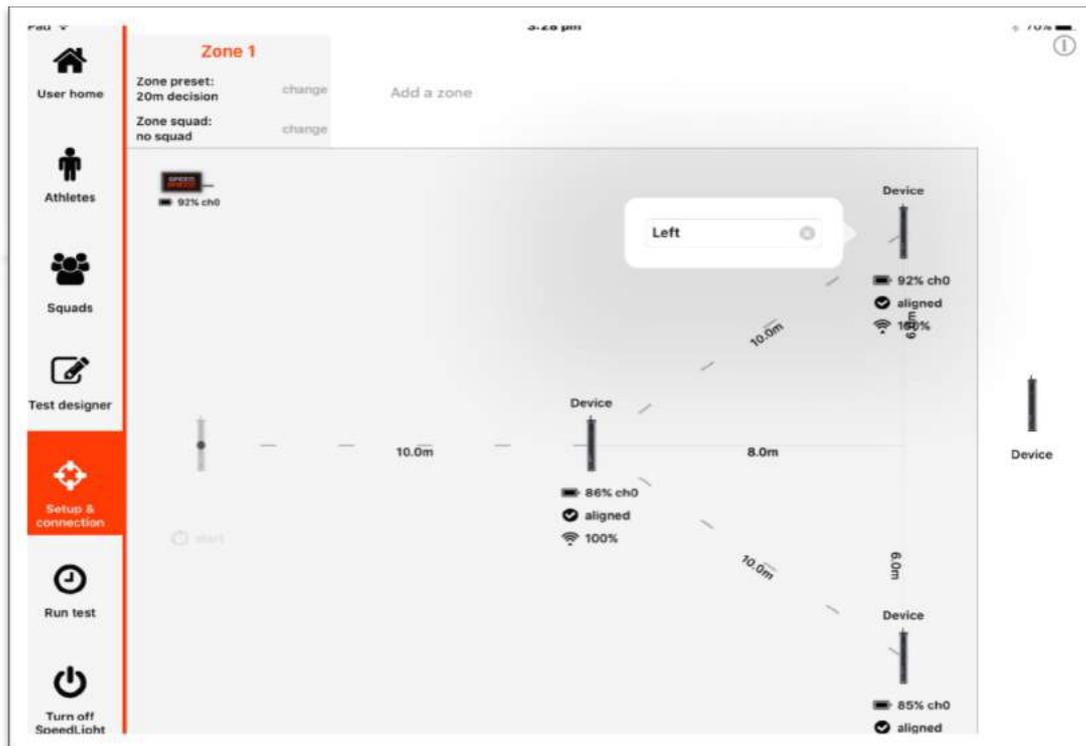
You can run up to 4 different tests with 4 different squads in what is known in the SpeedLight app as a zone. Simply tap Add a zone at the top of the window, select your desired test setup and squad, and drag the required SpeedLight devices into position.

Once each device has been dragged into position to completely fill the designed test(s), you are able to proceed to the '*Run test'* window via the Navigation Toolbar. If you are missing any devices, you will not be able to proceed past the '*Setup & connection'* window.

4.5   Operating Multiple Systems Simultaneously

Most commonly, users of the SpeedLight System will have one Wi-Fi Access Point and one SpeedLink, to connect to one iPad only. It is possible however to run multiple systems in the one location, across multiple iPads. This section describes the hardware you require to do so, and how to set up the system.

4.5.1   Splitting Your System Over Multiple Locations

For each individual testing location you must have at least one iPad, one Wi-Fi Access Point, and one SpeedLink. Therefore, if you'd like to split your SpeedLight System for testing over two different locations at the same time, you will need two iPads, two Wi-Fi Access Points, and two SpeedLinks. Contact Swift if you'd like more information or assistance in determining what you need to fulfil your testing requirements.

To connect both systems, simply follow the instructions given previously in Section 4, treating each system as an individual system.

Ensure each testing location is at least 100 metres (330 feet) from each other to ensure there is no interference from each system.

4.5.2 Running Multiple Tests Simultaneously in One Location on One iPad

You can run multiple tests simultaneously through the one iPad by utilising the four zones available to you in the '*Setup & Connection*' window. See Section 2.7.1 – Setting Test Zones for directions on how to do so.

4.5.3 Running Multiple Tests Simultaneously in One Location on Multiple iPads

It is also possible to run multiple tests in the one location, with each test being controlled by an individual iPad and user. To do so, each test will require its own SpeedLink and iPad, while all tests share the same Wi-Fi Access Point.

For example, for operating **TWO** SpeedLight systems in the same area, you will need:

- One Wi-Fi Access Point
- Two iPads
    - o Required quantity equal to the number of SpeedLight systems you wish to use.
- Two SpeedLinks
    - o Required quantity equal to the number of SpeedLight systems you wish to use,
    - o Each SpeedLink **must** have a unique fixed IP address (labelled on the front of the SpeedLink).

Please ensure no other Swift Wi-Fi Access Points are switched on within 100m of each other.

To setup the multiple systems, please follow the procedure below. Note this procedure is brief and less detailed than the procedure outline in Section 4.3. Refer to Section 4.3 if you need more information on turning on and connecting to your Wi-Fi Access Point and SpeedLinks.

a) Turn on your Wi-Fi Access Point and connect to its generated Wi-Fi network 'SpeedLAN_X'.

b) Turn on **one** of your SpeedLinks and wait for 45 seconds for it to automatically connect to the Wi-Fi Access Point.

c) On the iPad you wish to use with this SpeedLink, go to the '*User home*' tab and select '*Options*' from the bottom-right corner.

d) Enter the IP Address shown on the front of the SpeedLink exactly into the field '*SpeedLink ip address override*'. Select '*Done*'.

e) Open the '*Setup & Connection*' tab. The SpeedLight app will now connect to the SpeedLink.

f) Select your test and squad you wish to run.

g) Turn on and connect your SpeedLight devices you require for your specific test (Timing Gates, SpeedStarts, SpeedReaders) to the SpeedLight app.

h) Drag and drop your SpeedLight devices into the test.

i) Select the '*Run Test*' tab.

j) Repeat steps b – i for each of your remaining SpeedLinks. Ensure each SpeedLink has a different IP address listed to the previous SpeedLinks used.

5. Running Your Test

5.1 Athlete Starting Methods

Either the SpeedStart or Timing Gate is used as the starting device in a SpeedLight test. Ensure you are familiar with the 3 different starting modes available: Normal, Manual 2-Stage, and Steady Start, and select which mode best serves your test design (see Section 2.3.1 – SpeedLight Test Starting Modes for more details).

5.1.1 SpeedStart

When using the SpeedStart, the athlete obstructs the sensor beam between the SpeedStart and its Reflector. This may be obstructed by the athlete's hand, foot, or any other body part, as well as any other object, such as a match ball for example. Timing starts when the athlete, or object, leaves the path of the sensor beam. The SpeedStart starting method is the most accurate starting method used with SpeedLight Systems.

5.1.2 SpeedLight Timing Gate

If you do not have a SpeedStart, you will begin your test with a SpeedLight Timing Gate with what is known as a 'flying start'. This differs to the SpeedStart, as the athlete begins behind the Timing Gate, not obstructing the beam between the Timing Gate and its Reflector. Timing begins when the athlete first breaks both beams of the Timing Gate.

A common starting method adopted when using a Timing Gate as your starting hardware is to have the athlete begin 50cm (20") behind the start line. Keep in mind timing is initiated when the athlete first passes through the Timing Gate, therefore it is important the 50cm, or whatever distance you choose to use, is maintained between athletes.

5.2 Running the Test

Now you have your SpeedLight System switched on, placed in the correct location, aligned, and connected to the SpeedLight app, it's time to run your tests!

Open the '*Run test*' window from the Navigation Toolbar in the SpeedLight app. Select your Athlete, tap '*Arm System*' and wait for the SpeedStrobe on the first Timing Gate to turn green (based on running '*Normal*' starting mode). As soon as this SpeedStrobe turns green, the system is armed and ready for the athlete to begin their test. Perform the test and watch the athlete's splits appear in the SpeedLight app on your iPad in real time.

5.2.1 TTL Output from Timing Gate

On the front of the Timing Gate you will notice a port labelled "Out - Trigger". This port can be used to integrate the SpeedLight system with other forms of technology such as motion capture systems via a TTL output when the Timing Gate is triggered. Contact Swift if you'd like more information on this capability.

5.3 Test Results

After running your test, you will see your most recent results for each Athlete located at the top of the Athlete's results list, along with the test name and time. Tap the ⓘ next to each result if you'd like to add any notes to this result, or to enter the number of bounds to calculate the Sprint Bound Index (SBI).

To delete a result, simply swipe left on the result and tap Delete. You can also view and delete each result under each '*Athlete'* in the Athlete tab.

6. <u>Updating SpeedLight Device Firmware</u>

At Swift Performance, we are continually working to improve the performance of your SpeedLight devices and improve functionality. Therefore, from time to time we may release various firmware updates for you to install in your SpeedLight devices. This can all be carried out by the user – no need to ship your devices back to us for upgrade.

Whenever there is a firmware update for any device, the update will be embedded in the SpeedLight app on your iPad. Therefore, it is important you keep your SpeedLight application updated not only for app enhancements, but for these firmware upgrades as well.

Each time you connect a SpeedLight device to the SpeedLight iPad application, the app will check the firmware of your device against the latest firmware version stored in the app. If one or more of your devices needs an update, you will be notified with a message in the app informing you what device needs the update (right).
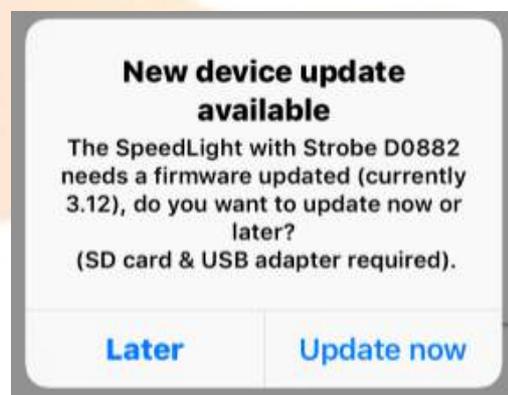
To update the device, you will require a MicroSD Card and SD Card Adapter (supplied with SpeedLight system) to update your SpeedLink and SpeedReader. To update a SpeedLight Timing Gate or SpeedStart, you will also require a USB Drive (user supplied).

New device update available
The SpeedLight with Strobe D0882 needs a firmware updated (currently 3.12), do you want to update now or later?
(SD card & USB adapter required).

Later   Update now

If you are ready to update your device(s), insert the MicroSD Card into your SpeedLink and tap **Update Now**. The app will now take a few minutes to copy the necessary firmware files onto the MicroSD card. Once completed, your SpeedLink will turn off automatically.

You can also find the latest firmware files on our online knowledge base. Go to support.swiftperformance.com and search for "SpeedLight Firmware Update" in the portal.

6.1   Updating SpeedLink/SpeedReader Firmware
To update your SpeedLink or SpeedReader, ensure your device is turned off and insert the MicroSD Card with the updated firmware files into the device. Turn on your device.

The red *Status* light on the device will flash quickly for 5-10 seconds, indicating that the device is reading and updating its firmware. After the fast flashing finishes, remove the MicroSD Card from the device. Reconnect the device to the SpeedLight app. If you do not receive the update message again, your device firmware has been successfully updated.

6.2   Updating SpeedLight Timing Gate/SpeedStart Firmware
You will require a USB Drive in addition to the supplied MicroSD Card and SD Card Adapter to update these devices. Take the MicroSD Card from the SpeedLink and transfer the contents of the MicroSD Card onto a USB Drive via a computer. You can also find the latest

firmware available online at support.swiftperformance.com by searching for '*SpeedLight Firmware Update*'.

Some important notes about this process:

- Your USB Drive must not have a capacity greater than 16GB. If it does, your devices may have issues reading the firmware from the USB Drive,
- You must copy the files directly as individual files to the root folder of the USB Drive. That means, do not copy the files into a folder on the USB Drive,
- Use a Windows PC to transfer the files onto the USB Drive.

Ensure all devices are turned off before beginning the update process.

1. Insert the USB Drive into the designated USB slot on the device.
2. Turn the device on. Wait 15 seconds for the firmware to be installed.
3. Remove the USB from the device.
4. Hold the power button for 5 seconds to reset the device.

The device will now reset with the updated firmware installed. If you do not have a SpeedLink turned on and are not in *Setup & connection* mode, the device will time out after 20 seconds.

7. Troubleshooting

If you experience any issues with your system or have any general enquiries, please refer to our online support portal which can be found at support.swiftperformance.com. Here you can find:

- updated user manuals,
- frequently asked questions,
- troubleshooting tips,
- Swift news.

If you are still having issues or need more information, submit a ticket via the same website under the 'Tickets' tab and select 'Start Ticket'. One of our staff members will be in contact with you to help answer your questions as soon as possible.

8. Contact Us

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