DCSLinkStream User Guide

Detailed instructions for the DCSLinkStream Fish-Measurement Application

Big Fin Scientific

1.0	03/22/2015	Initial Release
1.1	07/2/2015	Added screenshots, minor edits.
1.2	08/8/2016	Some Minor Format Changes and Removed Special Case AF Section
1.3	08/8/2016	Added in Custom Field Creation in MV and Types of Fields Explained
1.4	08/9/2016	New Decal added. Removed some old UI sections
1.5	08/10/2016	Revamped Study Settings Section. Custom Export Format section
1.6	08/11/2016	Added In New Customizable Summary Page Features
1.7	11/1/2016	Updated and merged Special Key Mapping section into document
1.8	11/3/2016	Added in Pit Tag section
1.9	11/11/2016	Added in Special Trigger Features section
1.10	11/16/2016	Added in note on custom GPS field creation
1.11	11/16/2016	Updated Trigger Section to reflect the new Trigger Logic Order
1.12	01/31/2017	Added note on Saving Export Formats.
1.13	01/31/2017	Name Change from DFS to DCS
1.14	02/06/2017	Added in Multi-Segment Field Type Section
1.15	02/06/2017	Added in Calculator Field Type Section and defined the color
1.16	02/07/2017	Update Multi-Segment CSV format for dashes
1.17	03/27/2017	Added in additional info on Tag Action Message and Tag Note
1.18	03/27/2017	Added Tag History Import method along with example.
1.19	03/29/2017	Added How to Record Tag Values and using the Internal Pit Tag Reader Systems.
1.20	05/04/2017	Updated Application Settings Section
1.21	05/15/2017	Updated for v1.6 features
1.22	07/26/2017	Added to Peripherals section telling users to attempt pairing through OS for some peripherals
1.23	07/26/2017	Change name from DCS -> DCSLinkStream and added appropriate screenshots
1.24	07/27/2017	Changed text formatting – some body sections were formatted as headings – finished todo
1.25	08/04/2017	Added in Batch page list functions – Add, import, search batch functions
1.26	08/29/2017	Added in note regarding voice response initialization time.
1.27	12/08/2017	Added in date and time export formatting sections

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Introduction

This document describes the use of the DCSLinkStream Android Application, a low-cost and extremely adaptable application for gathering field data of many types. While the DCSLinkStream Application was originally made with fish measurements in-mind, the App has changed over time so as to be easily used for animals of many kinds as well as forest health assessments, as an example. Now, data from many disciplines can be gathered, quickly and easily, all on a low-cost Android device.

The DCSLinkStream application can be used standalone (via manual data entry) or, for higher efficiency, connected with a wide variety of hardware, including the DCSLinkStream fish measurement boards, calipers, weight scales, label printers and more. All of the data from these peripherals are incorporated into the database on the tablet. Data is easily transferred to a PC for analysis in both "real-time" (records are sent via Bluetooth as they're stored) or at any time as a Study Package (all records of a study at-once).

Please see the "Getting Started Guide" before reading this document to become familiar with some of the hardware, accessories, and various connections.

System Overview

For the remainder of this User Guide, when we refer to the DCSLinkStream System, we're making the assumption that the DCSLinkStream Application is being used in-conjunction with a Big Fin Scientific Fish-Measurement-Board (FMB).

Note: The DCSLinkStream App does not require an FMB (or any other data-peripheral) to operate.

The Fish-Measurement-Board offers a marked increase in measuring efficiency compared to manual data entry. The FMB connects to the DCSLinkStream application running on the Android tablet via Bluetooth and serves as:

- a highly-accurate length measurement device
- a shortcut array and general data-entry device

The FMB, like many data-peripherals, communicates with the DCSLinkStream Android application via Bluetooth wireless. Together, these devices provide the user with a rich user-interface and multiple connections to peripheral devices such as Weight-scales, PIT readers, bar-code scanners and GPS antennae.

User input into the study database is accomplished in two ways: via the tablet (the user tapping on the touchscreen) or via the Fish-Board, which has a full keyboard function, along with "hotkeys". Feedback to the user

is accomplished via the tablet screen and audio through a Bluetooth speaker or headset. Other data acquisition is accomplished via Bluetooth wireless connections to the various peripheral devices mentioned above, which happens automatically, or by manual invocation by the user.

By seamlessly integrating the peripheral devices and providing a quick, user-friendly environment for manual data-entry, the system greatly decreases the time and cost associated with the acquisition of fish-study data.

Getting Started

Before getting into the application, we recommend reviewing the Getting Started Guide. The Getting Started Guide provides an overview of the basic skills that are important to using the DCSLinkStream application and board. These skills include:

- Turning the tablet on and starting the application
- Connecting to a board via the application
- Using the stylus tool, swipe modes, and how the buttons on the board work

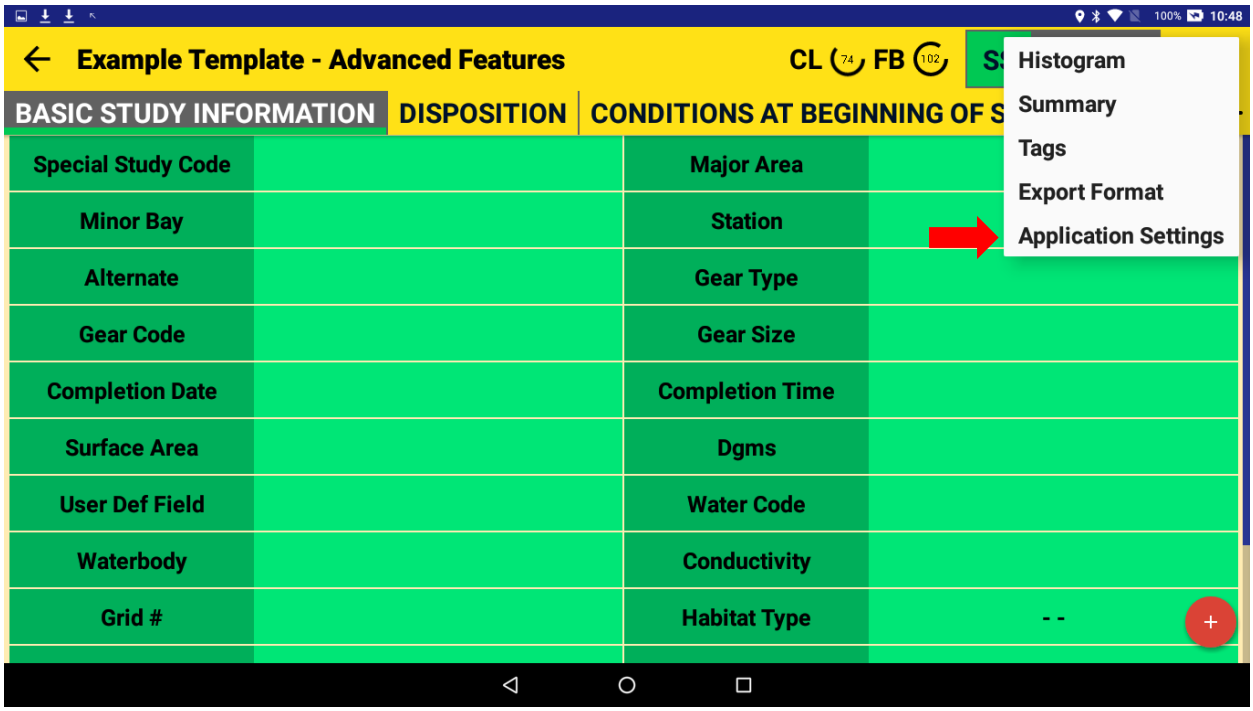
Note that the instructions and screenshots included in this guide are for specific example cases. Users can create their own fields, so your studies may look different from the ones depicted in this guide.

The Android Application

General Settings

The General Settings area is accessed by tapping on the Main Menu (3 horizontal bar) icon in the upper right corner of the application or by "right swiping" your stylus on the fish-board in the green zone (numeric zone) and then selecting the settings icon on the fish-board with the stylus.

The picture below shows the Main Menu icon when the application is showing the Study Settings screen, but the icon will be present in the same location throughout the application.



In DCSLinkStream, there are 5 sections or areas into which information is organized:

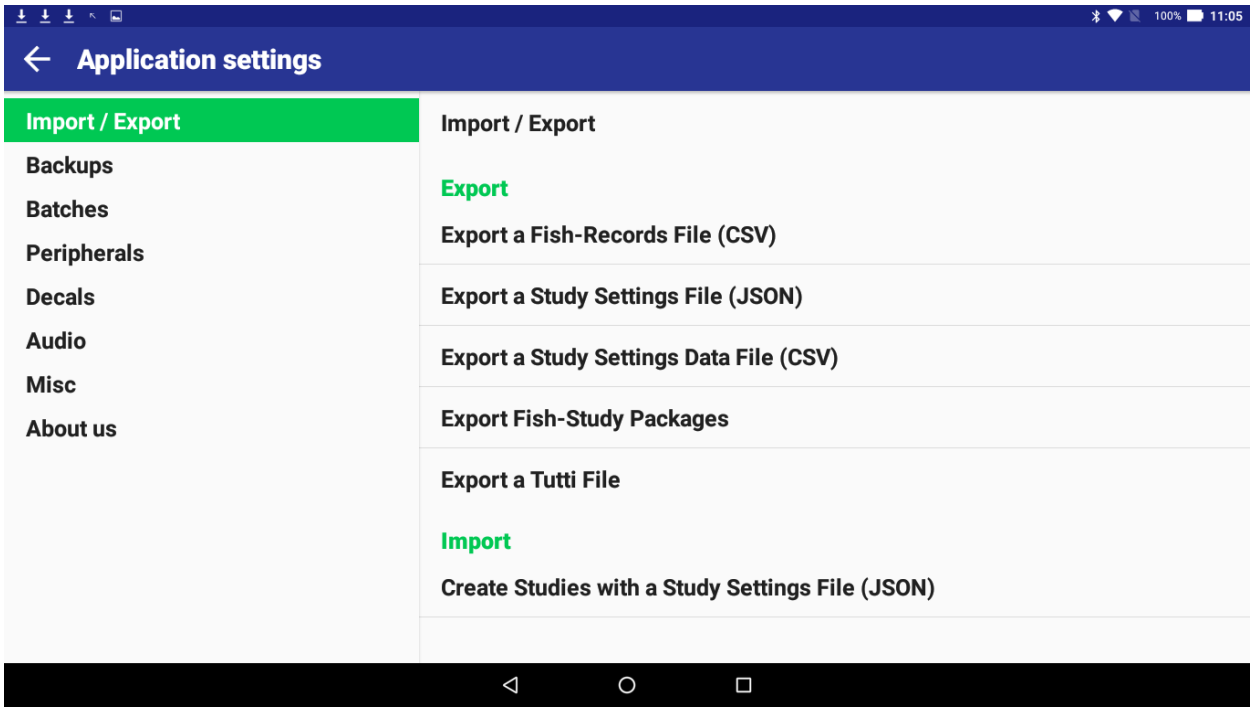
- Application Settings
- Study List
- Measurement View
- Study Settings
- Batches Screen

Application Settings

The Application Settings area is organized into eight sections:

- Import/Export
- Backups
- Batches
- Peripherals
- Decals
- Audio
- Misc
- About Us

Import/Export



Exporting

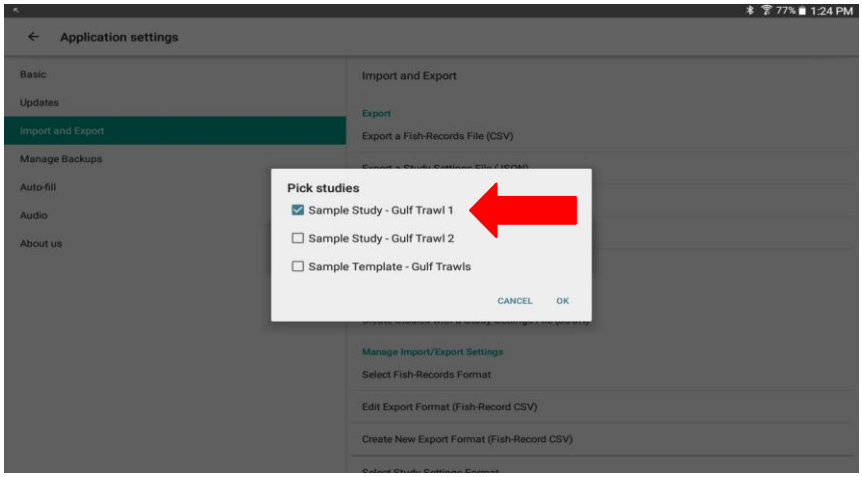
- Fish-Records File (CSV) – Basic file with all of the fish records, which can be opened directly from Excel.
- Study Settings File (JSON) – File with all of the settings for a study (location, gear type, voyage etc.). This type of file can be used as a template for future Study creation, avoiding repetitive Study setup.
- Study Settings Data File (CSV) – A version of the Study Settings File which is more human-readable and can be opened directly from Excel.
- Fish-Study Packages – Exports all of the above plus some supplementary files in one folder. Select this option to make sure everything related to your study is exported.

- Tutti File – This is a specialized export format. Most users should ignore this option.

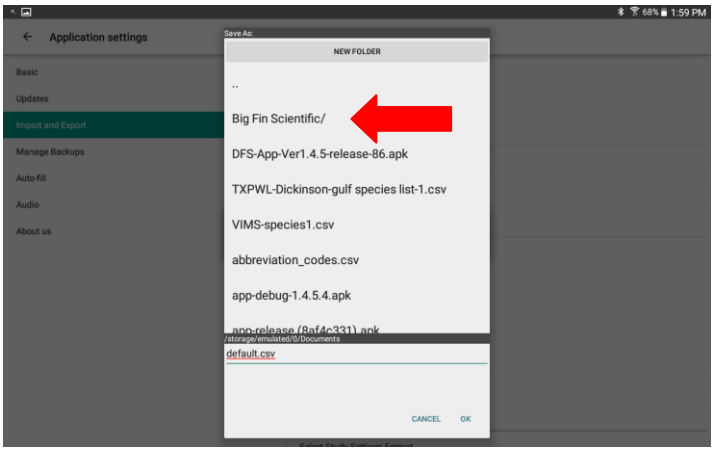
Example of use:

The process of exporting files is the same regardless of the type. Let's say you wanted to export a Fish-Records File called "Example Fish Record 1" to a folder called "Example Folder" within an existing folder called "Big Fin Scientific".

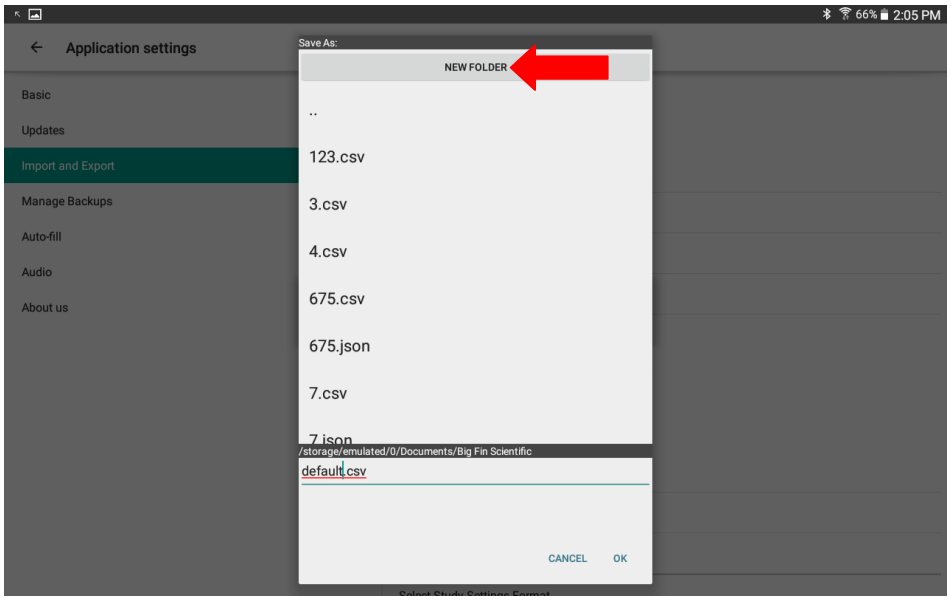
First, tap "Export a Fish-Records File (CSV)"



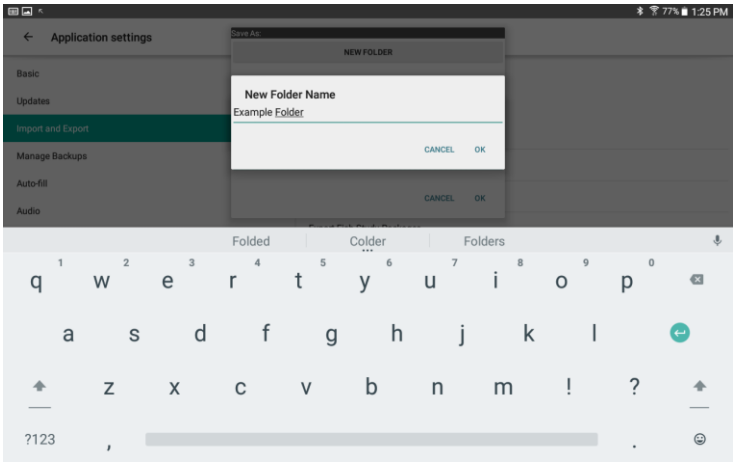
Next, select the study that you wish to export and tap OK.

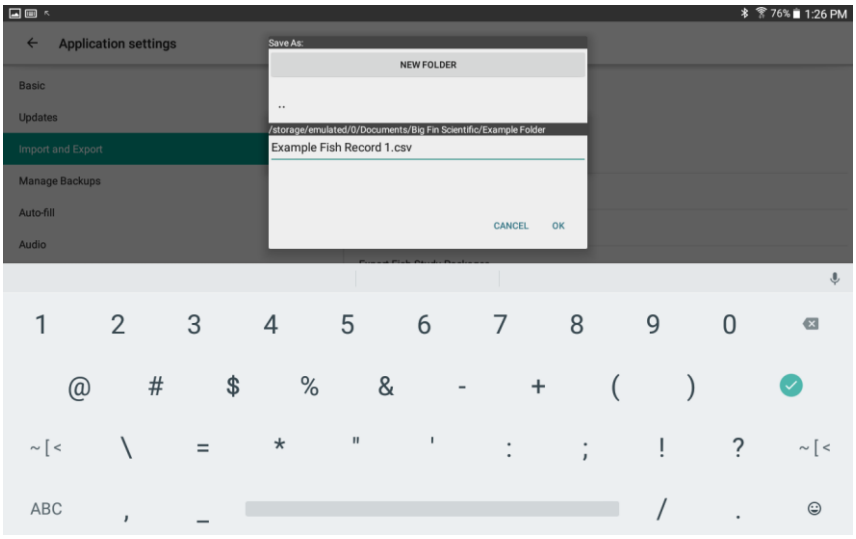


Tap "Big Fin Scientific". Note that you can navigate out of folders by tapping the dots located near the top of the folder navigation window.

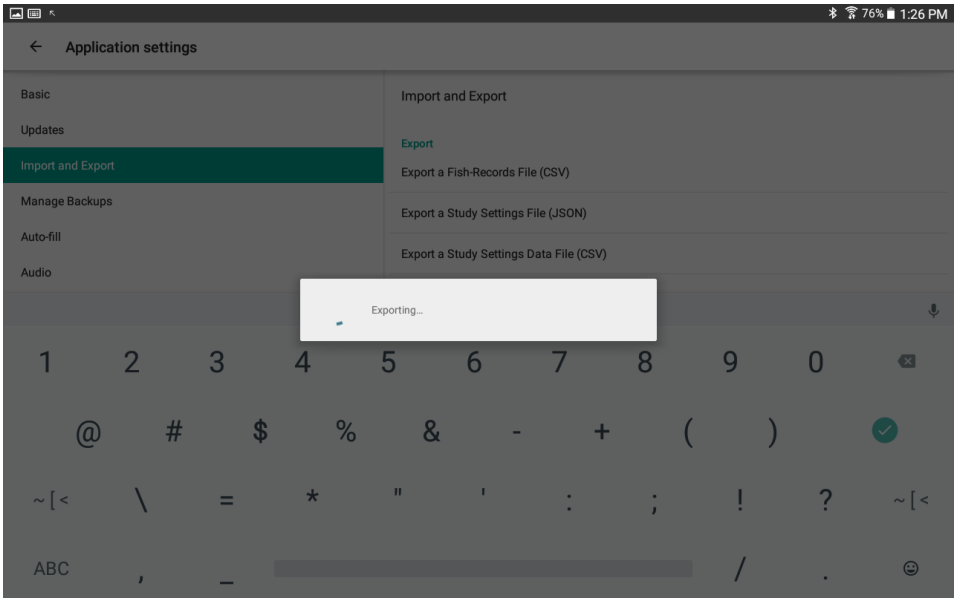


For our example, we want to create a new folder within the Big Fin Scientific folder. Tap "New Folder" at the top of the screen, and name your folder.

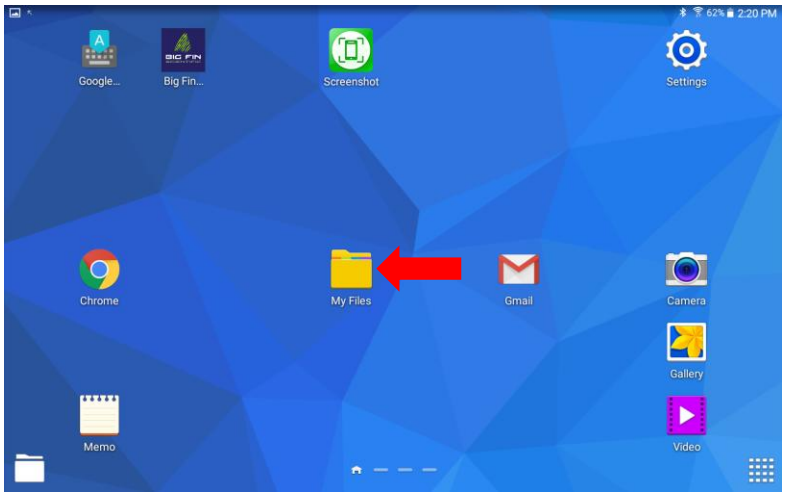




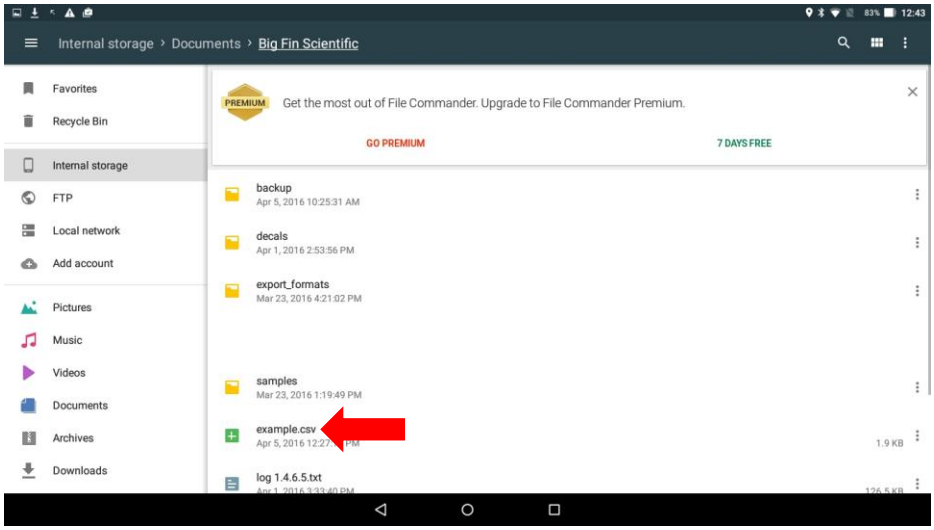
Now, give the file a name. We'll call it "Example Fish Record 1" for this example. Tap OK.



After tapping OK, the application will export the file to the specified location.

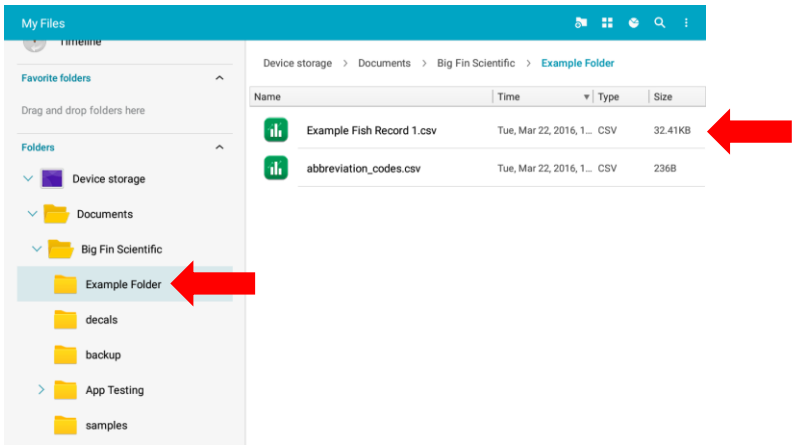


To access the exported file in the tablet, navigate out of the application by pressing the home button on the tablet, and then tap your preferred File Manager app.

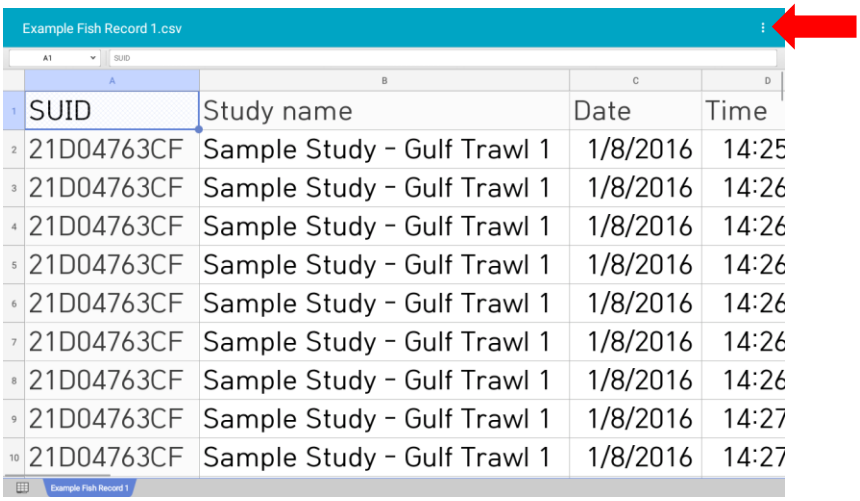


Note that not all tablets store files using the same system, so your screen may look different. For example, the screenshot above shows how files are organized on an Xplore Technologies tablet using the File Commander application.

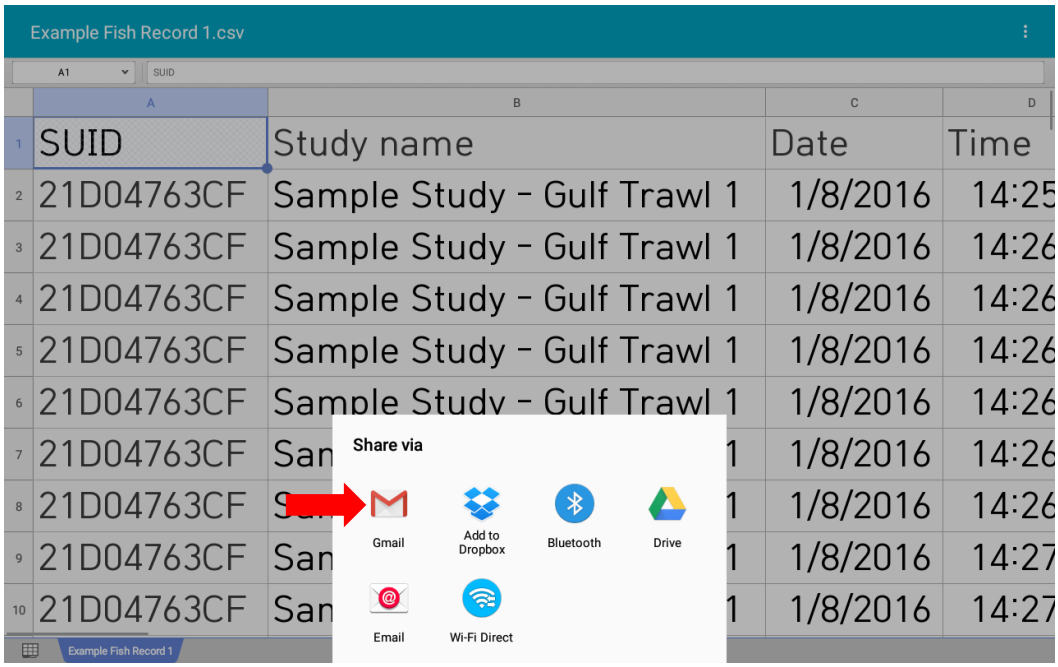
Back to the example:



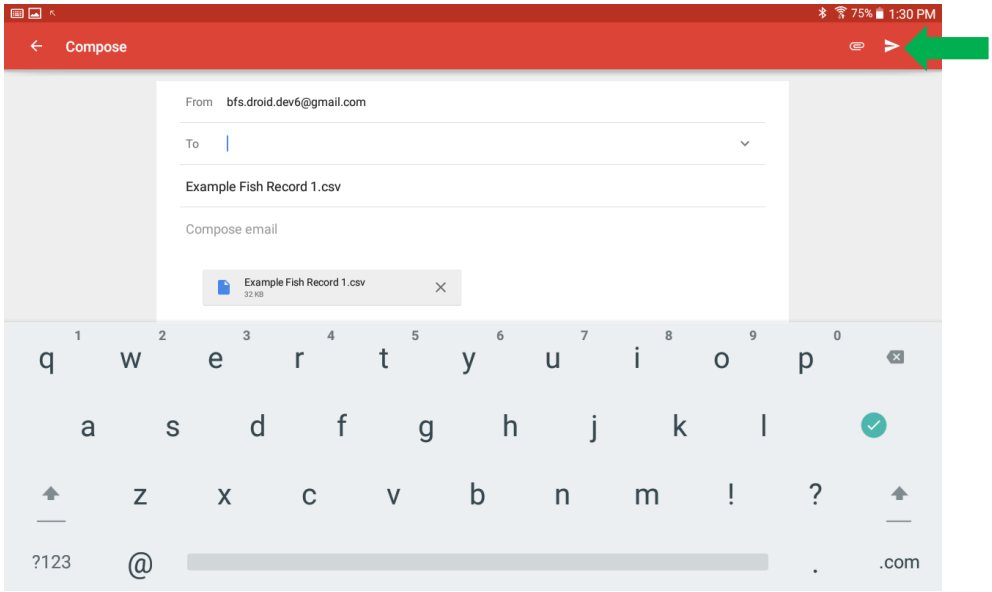
All of the folders are organized on the left hand side of the screen. The folder we created, Example Folder, is directly below the Big Fin Scientific one. To access the file we exported, tap "Example Folder" and then tap the "Example Fish Record 1" CSV file.



To share your data or send it to yourself, tap the 3 dots in the upper right hand corner of the screen.



Choose your sharing method. We'll use Gmail in our example.

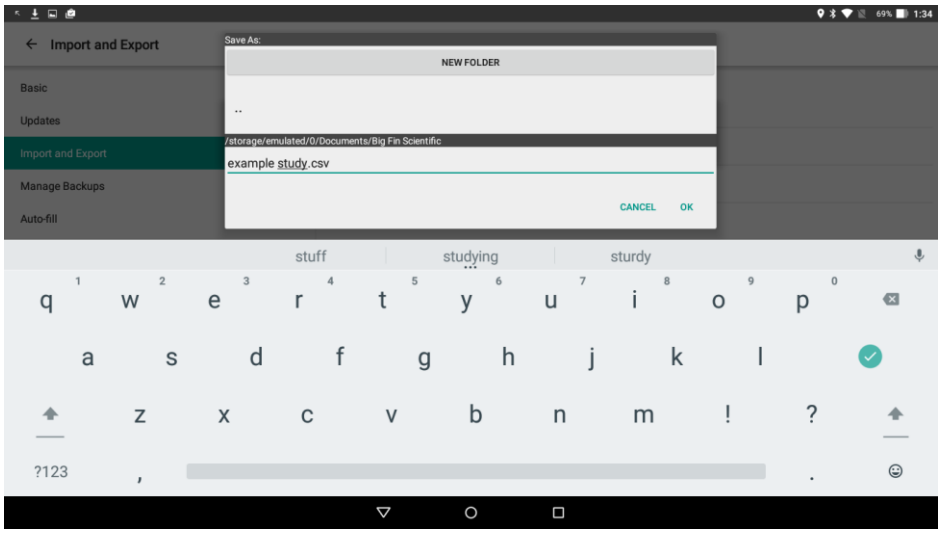


To send the file, tap the arrow located in the upper right portion of the screen.

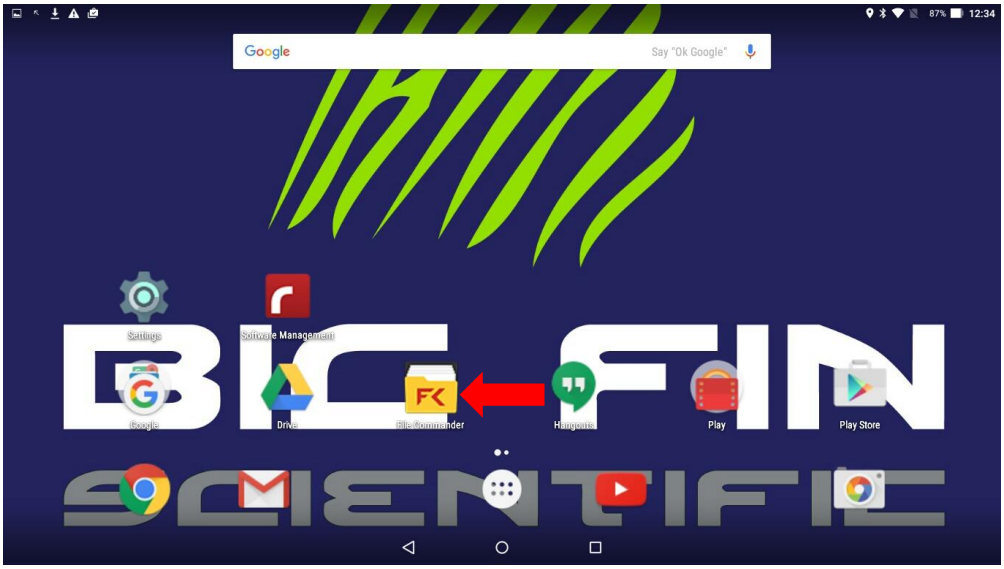
Exporting via USB

You can also export data files via USB if their tablet supports that functionality. The following example provides step by step instructions for exporting a file to a USB drive using an Xplore Technologies tablet.

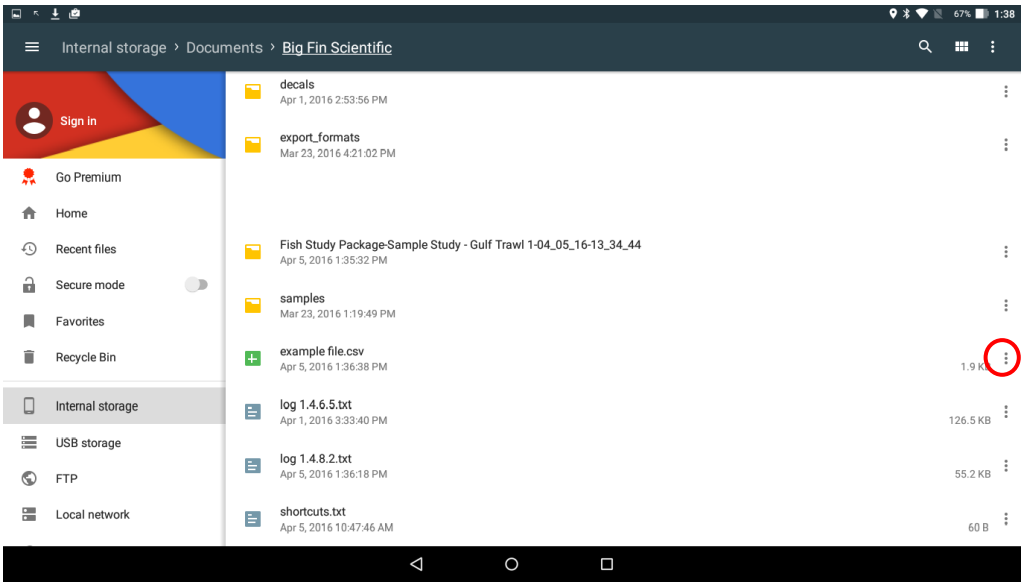
Example: Suppose you wanted to export a Fish Data File called "example study" to your USB drive.



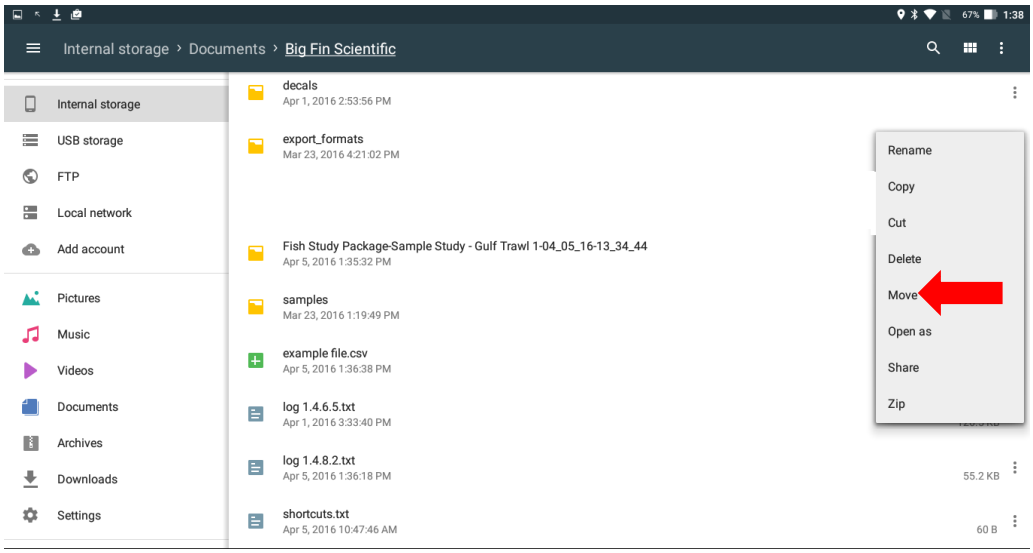
Name the file and designate the location on your tablet where you wish to save it, and tap OK. For this example, we will export the file to a folder called "Big Fin Scientific" located in the Documents folder.



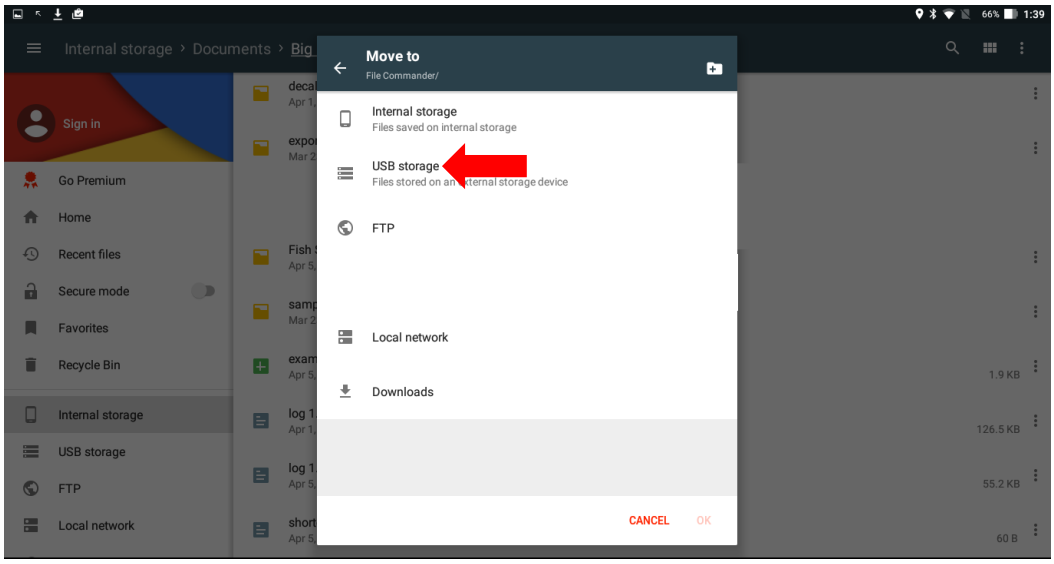
Navigate to whatever file manager application you use on your tablet. In this example, we are using File Commander on an Xplore D10 tablet.



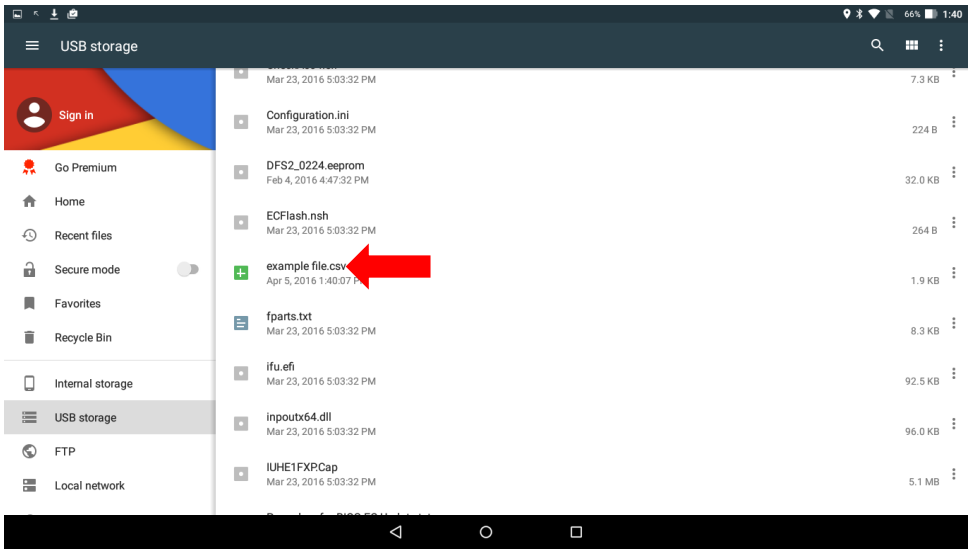
Navigate to the folder that we exported the file to, and then tap the 3 vertical dot icon directly across from the name of the file on the right side of the screen. A window will appear that provides you with options for actions like deleting, editing, and moving the file.



Tap “Move” located in the action window on the right side of the screen.



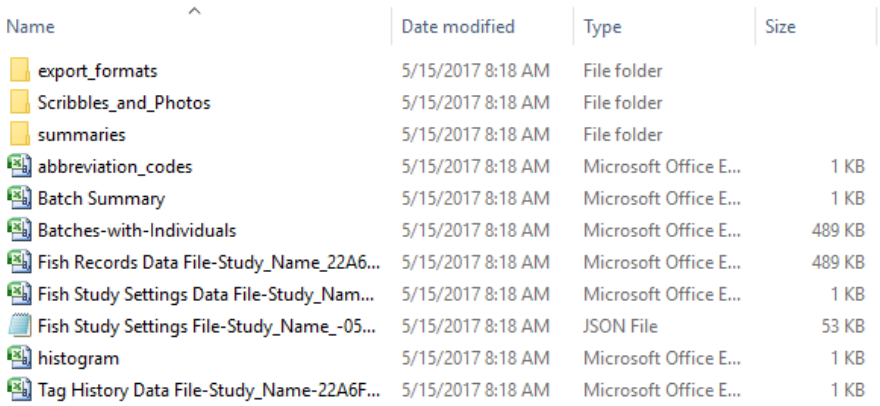
Navigate through the folders using the back symbol (←). Locate your USB drive, tap it, and then tap OK.



Important! As with all USB drives and applications, remember to "unmount" your USB drive before you remove it from your tablet, or the data may be corrupted.

Exporting a Fish-Study Package

A Fish-study package contains the fish-records and Study Settings CSV files as well as some supplementary files. The Study-Package option is a convenient way to export everything related to your study in one folder. The picture below shows all of the files that get exported within the fish-study package folder.



Name	Date modified	Type	Size
export_formats	5/15/2017 8:18 AM	File folder	
Scribbles_and_Photos	5/15/2017 8:18 AM	File folder	
summaries	5/15/2017 8:18 AM	File folder	
abbreviation_codes	5/15/2017 8:18 AM	Microsoft Office E...	1 KB
Batch Summary	5/15/2017 8:18 AM	Microsoft Office E...	1 KB
Batches-with-Individuals	5/15/2017 8:18 AM	Microsoft Office E...	489 KB
Fish Records Data File-Study_Name_22A6...	5/15/2017 8:18 AM	Microsoft Office E...	489 KB
Fish Study Settings Data File-Study_Nam...	5/15/2017 8:18 AM	Microsoft Office E...	1 KB
Fish Study Settings File-Study_Name_-05...	5/15/2017 8:18 AM	JSON File	53 KB
histogram	5/15/2017 8:18 AM	Microsoft Office E...	1 KB
Tag History Data File-Study_Name-22A6F...	5/15/2017 8:18 AM	Microsoft Office E...	1 KB

- Abbreviation_codes – This CSV file contains descriptive text for common abbreviation codes used within studies.

- Batch Summary – This CSV file contains a list of all of the batches, along with the batch level fields from your study. Each row in this file represents a batch and the batch fields are contained in columns.

- Batches-with-Individuals – This CSV file contains the fish records within the study along with the Batch that the records are within. Only one batch is reflected in a row. If your data contains records which belong to multiple batches, multiple lines are used to show the record for each batch to which it belongs. For example, if a record belongs to 2 batches called “Batch 1” and “Batch 2”, 2 rows will be generated for that record, one showing “Batch 1” in the batch field and the other “Batch 2”.

- Fish Records Data File – This CSV file contains all of the fish records in your study. Unlike the Batches-with Individuals file, if a single record belongs to multiple batches, the record is shown on a single row with multiple batches in one column which are separated by a “:” colon on the same row. The Fish Records Data File does not contain Batch fields or Study fields.

- Fish Study Settings Data File - This CSV file contains all of the Study-level field data, using two rows: a header row with the field names and a data row with the field values.

- Fish Study Settings Definition File – This JSON file contains the definition of your study, but no Individual Records (no fish records). This file can be imported into the DCSLinkStream application using the ‘Import’ section of the Application Settings and serves to provide an easy way to share your study

definition with colleagues so that you're all taking data on the same data platform with the same fields.

- Histogram – This CSV file contains exported data from the histogram portion of the application. Exporting this data allows the user to create their own histogram using their software of choice.

- Tag History Data File – This CSV contains all of the records from the study that have Tag values. This file is useful for users that are only interested in the specimens with Tag values.

- Export Formats Folder – This folder contains JSON files of the different export formats that can be imported into the application. These files are useful for standardizing the data that is exported from the application.

- Scribble and Photos Folder – This folder contains image files of the scribble fields that were recorded in the study. The unique ID of the record is shown in the name of each image. This allows the user to link the images to the matching record.

- Summaries folder – This folder contains CSV files of the different summary tables that have been used and saved within the study.

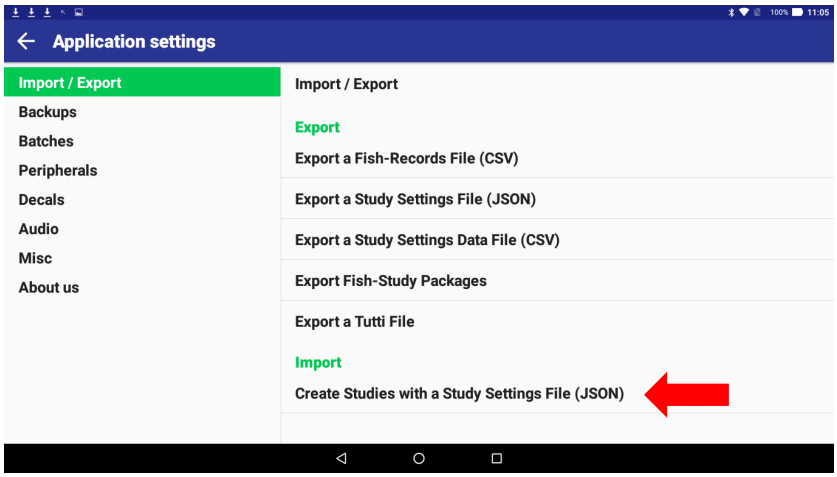
Importing

Create Studies with a Study Settings File (JSON) – allows you to import a study settings file in order to reproduce a study, with all the settings intact. Only the settings are imported with the "Create Studies" function. No fish-record information is imported with this feature. Note that multiple studies can be contained in a single Study Settings File.

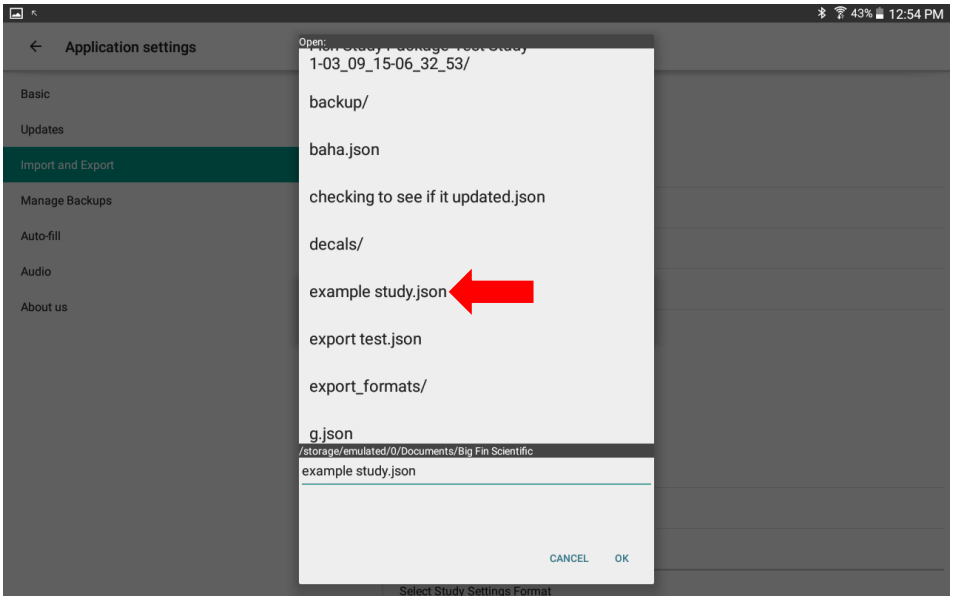
Example of Use:

Let's say you wanted to import the Gulf Trawls study settings file that has been saved on your tablet as "example study" in the Big Fin Scientific folder.

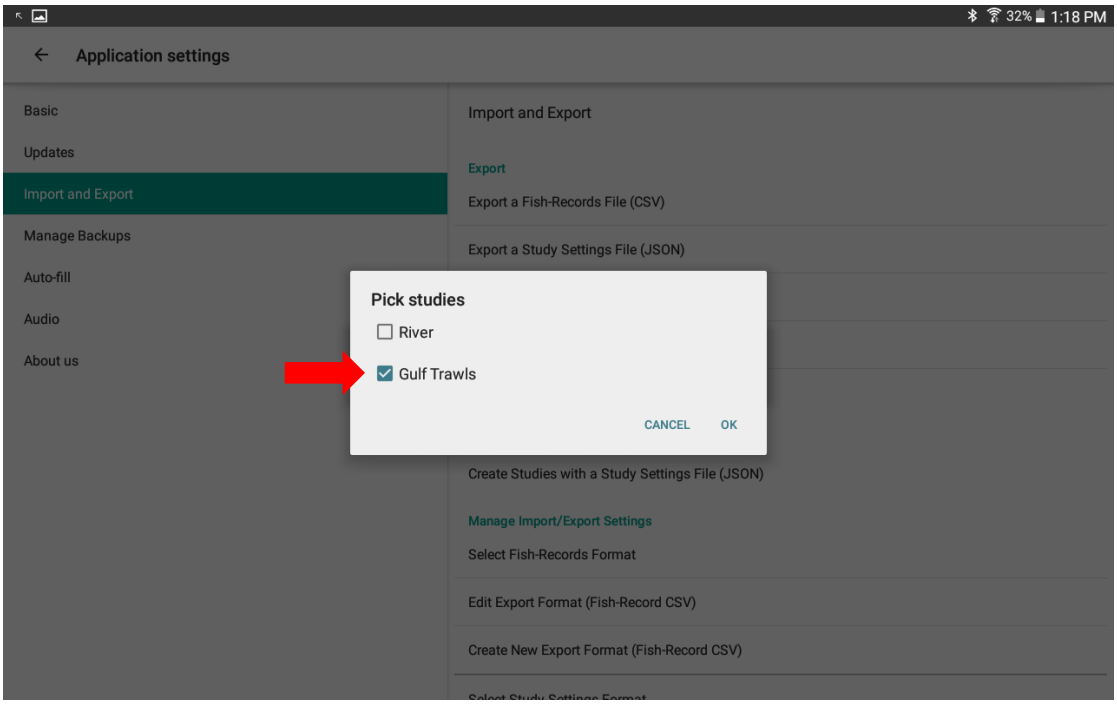
First, tap "Create Studies with a Study Settings File (JSON)"



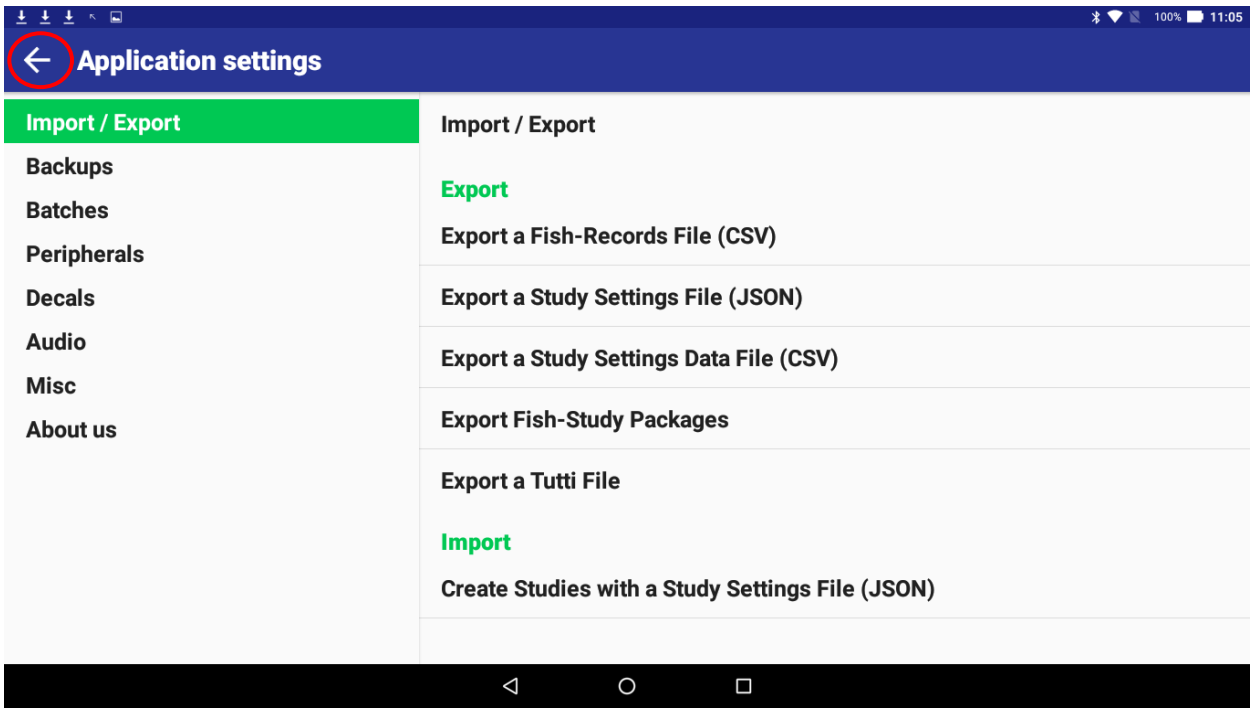
Find the name of file that contains the study settings that you wish to import and tap it. For our example case, that's the file called "example study".



Tap OK



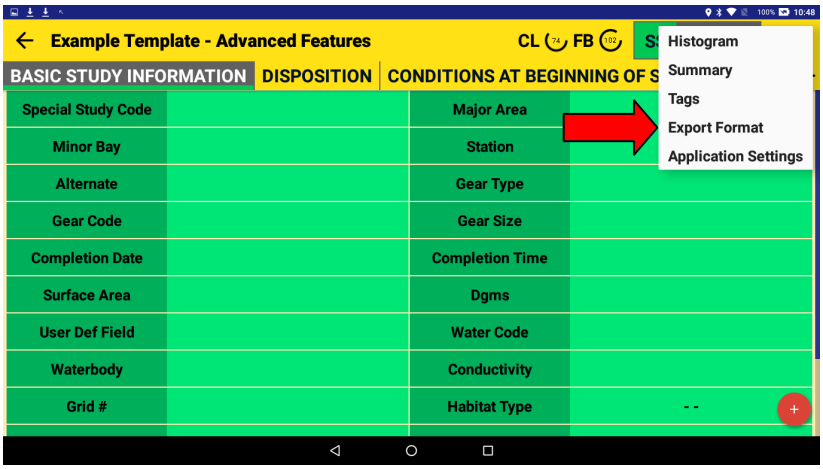
Specify the study settings that you wish to import by tapping the box next to its name. In our case, we only want to import the Gulf Trawls template. Tap OK to continue, and the Gulf Trawls study will available in the Study List section of the application.



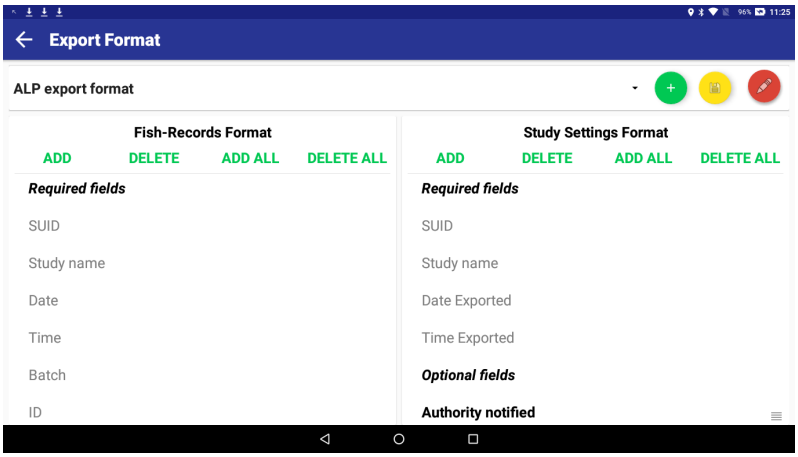
To open the study template we just imported, navigate to the Study List section of the application by tapping the back arrow (indicated above) and using the Main Menu (3 horizontal bar) icon discussed in the Basic section of this document.

Custom Export Formats

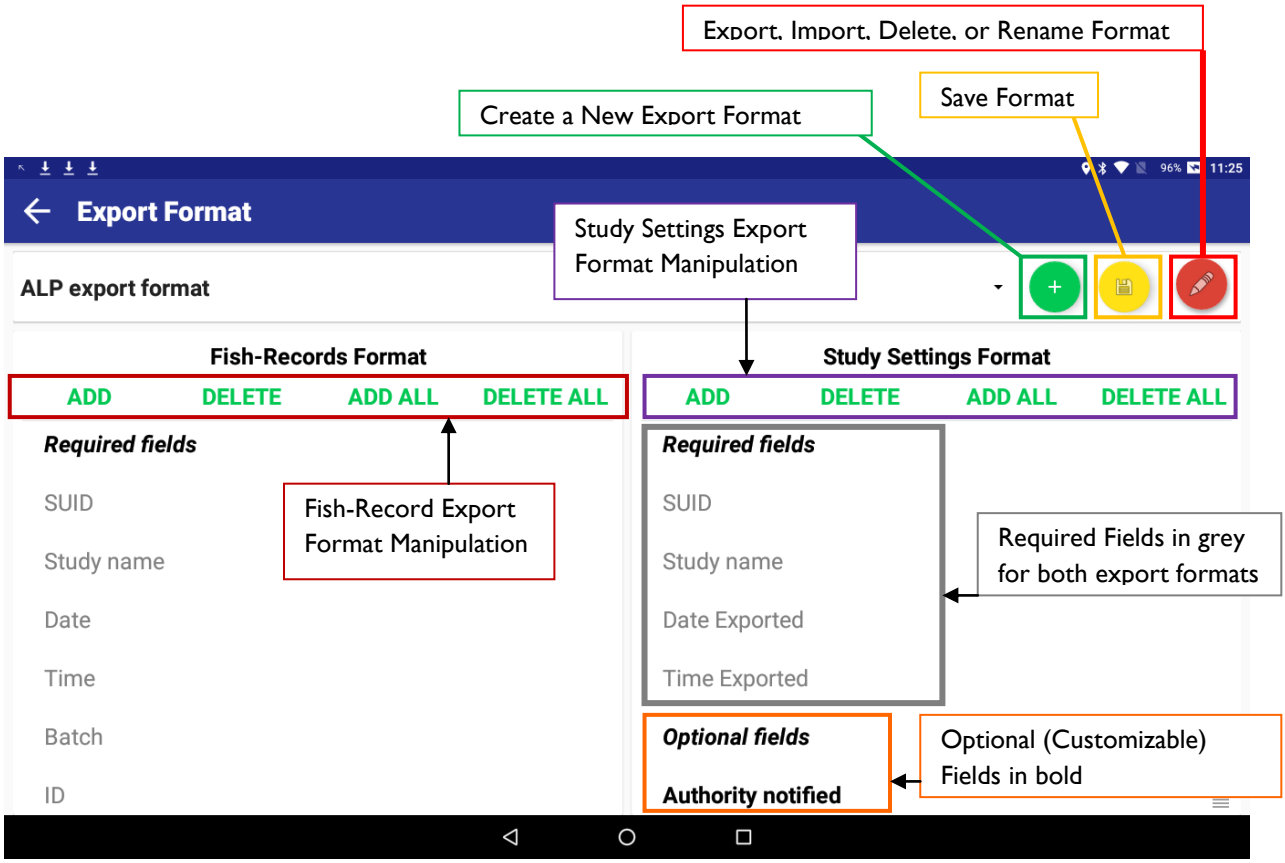
The DCSLinkStream application gives users the opportunity to create their own custom export formats to fit unique demands. To create a custom export format, open a study, tap on the 3 horizontal bars icon and find the 'Export Formats' selection. This is shown in the picture below.



Tapping on "Export Format" brings you to this screen:



Export Format Screen Explained:



The picture above explains the functions on the Export Formats page. The left side of the screen represents the format of the Fish-Records file while the right side of the page represents the format for the Study Settings file. The functions at the top of the page allow the user to save, import, export, rename, delete, or create new export formats. The green buttons near the center of the page let the user manipulate the study settings and the fish-record export formats. These buttons function that same as the buttons on the records list dialog box. See *Measurement View Record List and Field Manipulation* section for more information on how these buttons work. The export format for both the Study Settings and the Fish-Records files are split up into two subsections. These subsections are the *Required fields* and the *Optional fields.*

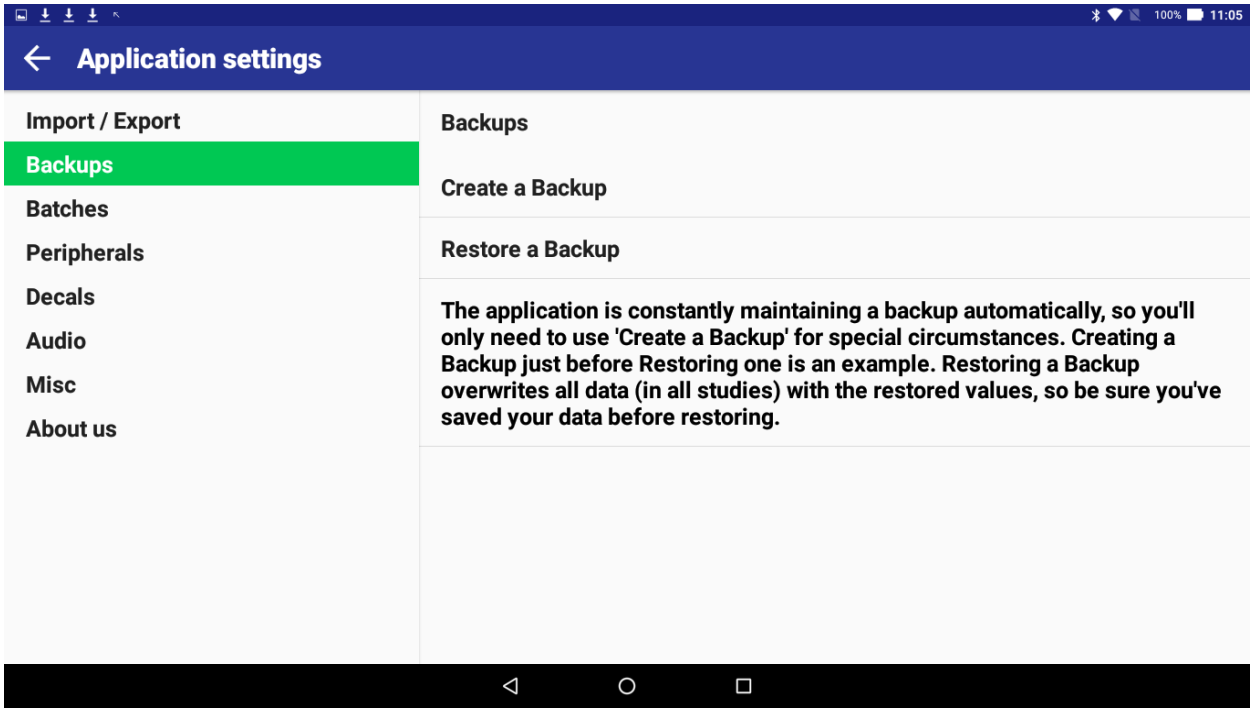
Optional fields can be deleted or added to the export format and are fully customizable. *The Required Fields* represent fields that cannot be deleted from the export format. The *Required Fields* will by default appear in the first columns in the exported CSV and JSON files. If these required fields are meaningless for the user's particular studies, then those columns can be deleted from the exported file later when opened in a spreadsheet program such as Microsoft Excel.

Field headers will be included in the exported files with field-names as columns and records as rows. The order of the field-names will match the field-order shown in the Export Format page.

Note: *The user must tap the SAVE button in the top right corner of this page in order to save their custom Export Formats. Any changes to the export format when NOT be retained unless the user taps this SAVE button.*

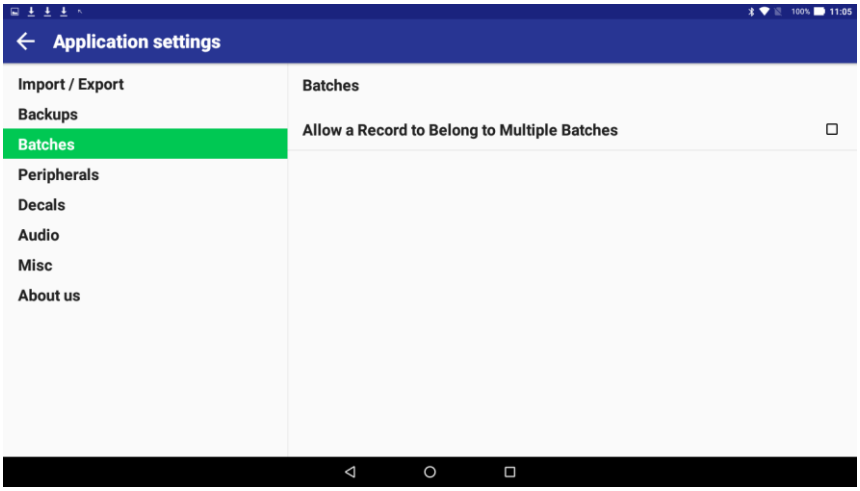
Backups

In the Backups section of Application Settings, the user can create or restore backup database files that allow the user to restore studies along with all of the fish-records and info located within the studies. Backups are automatically generated by the application. Date and time-stamps are used as the unique ID of the automatic backups. User-created backups can be given a unique name.



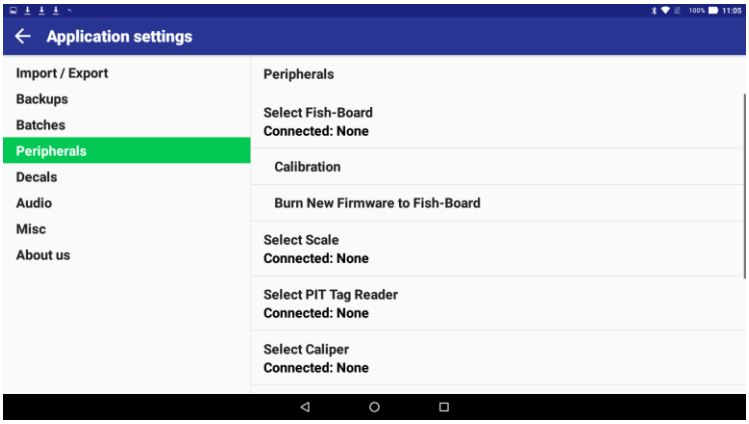
Important! Restoring a backup will overwrite all of the data and all of the studies with restored data so be sure to Create a Backup before restoring one from the list to make sure you can revert to your current database.

Batches



The Batches section in Application Settings allows user to change the way Records can be recorded within Batches. By default, the application is set to only allow one batch to be selected per record. In special circumstances, you may want to allow a record to belong to multiple batches.

Peripherals



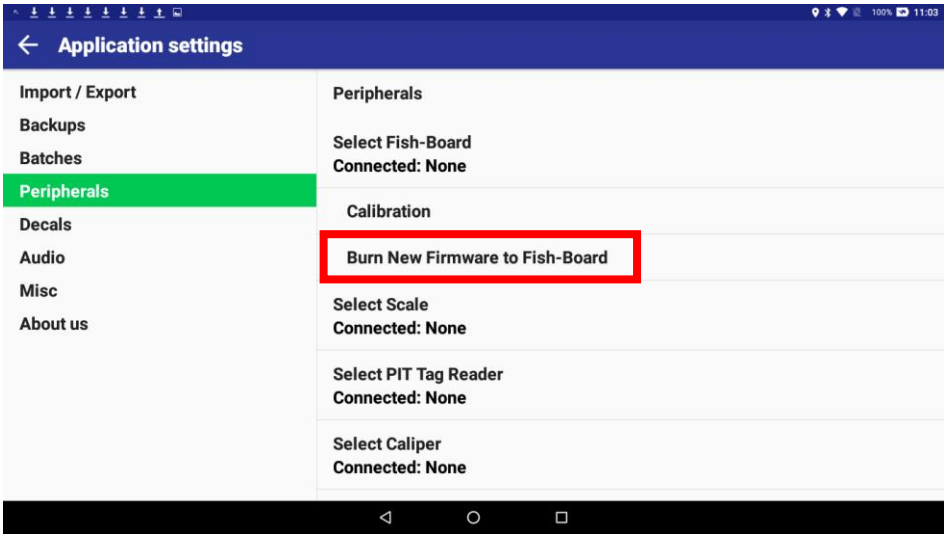
In the Peripherals is where you create the links to your hardware. You'll create these links just once, after which the application will automatically connect to your hardware whenever it's within range. For detailed instruction on setting up your board, please view the Getting Started Guide. Other options here include calibration, label printing options and GPS refresh rate selection. Selecting "Print Every Record" causes a connected label printer to create a label at every record creation. Another option for label creation is to map a shortcut key on the fishboard or set up a triggering event.

Note: *Some peripherals such as the HPR lite Tag Reader can be hard to pair through the Linkstream application due to hardware settings. In these cases, pair the device through the Bluetooth section of the Tablet Settings and then try to connect to the device again through application settings*

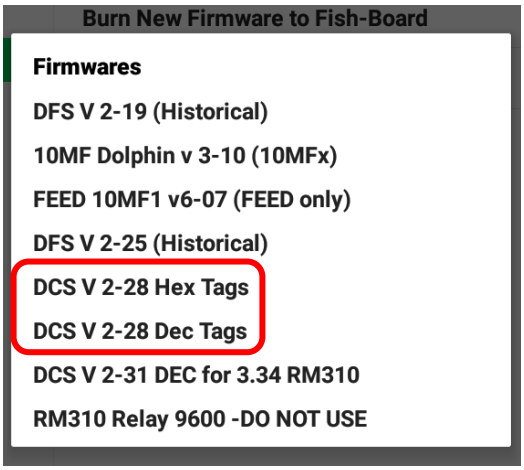
Burning Firmware to Fish-Boards

In rare cases, you'll want to update your firmware. Do not update firmware unless you know for certain that you should. Please call us for help if you're experiencing issues; in general, the firmware is very robust and not the source of issues.

To update the firmware, go to 'Peripherals' section within the Application Settings



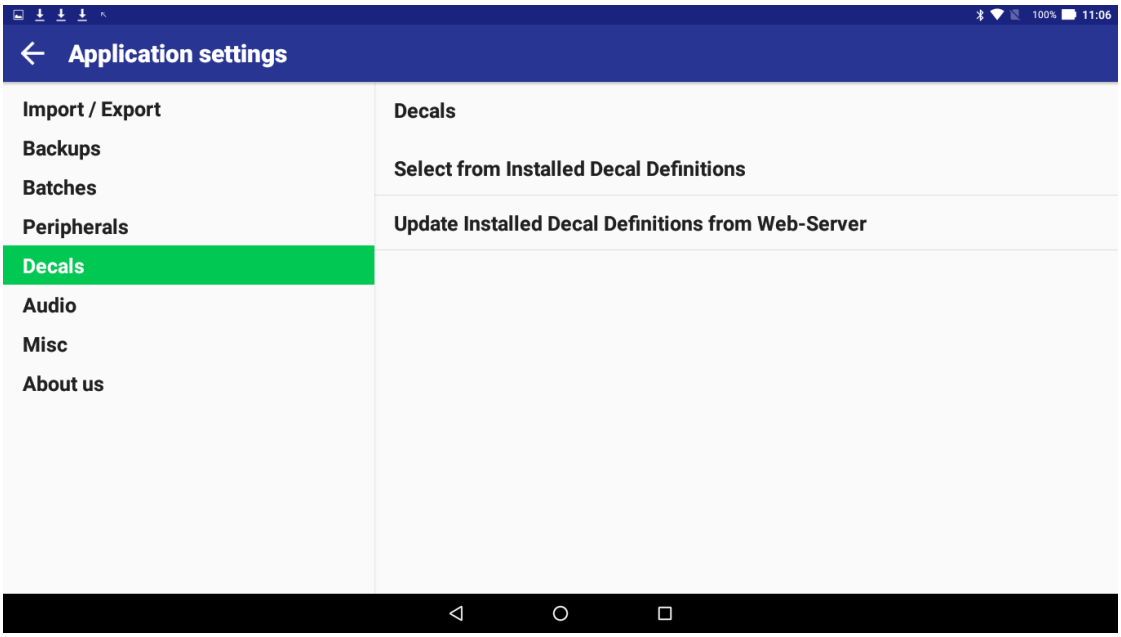
You must be connected to your fish-board and also have an active Wi-Fi connection in order to view the firmware list. Tap on 'Burn New Firmware to Fish-Board' selection. There are two different firmware versions that the user can use for the internal Pit Reader boards depending on whether decimal or hexadecimal format is desired. These are labeled accordingly. In the future, a switch will be implemented so that one firmware version will be able to handle both hexadecimal and decimal Tag formats.



Tap on the firmware version that you desire and then wait for the firmware updater to finish. You will be prompted to reset your fish-board to complete the update process.

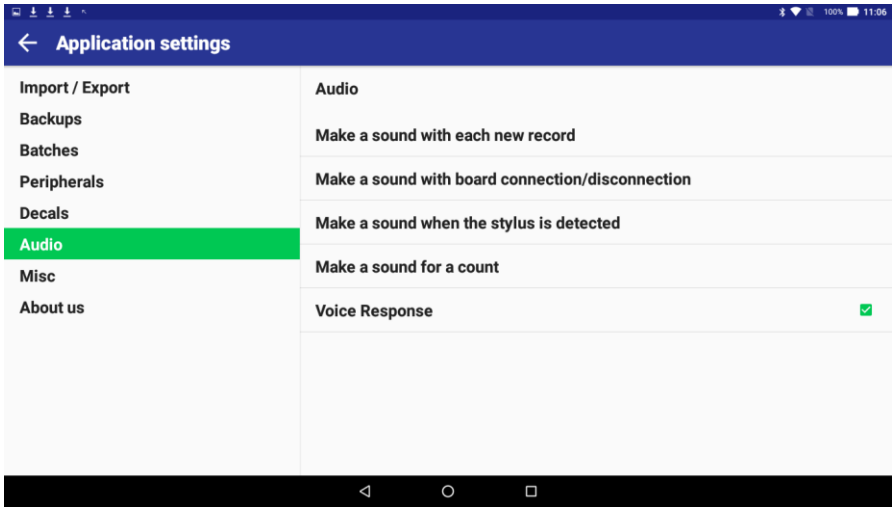
The application will automatically connect to the fish-board and display the new firmware version .

Decals

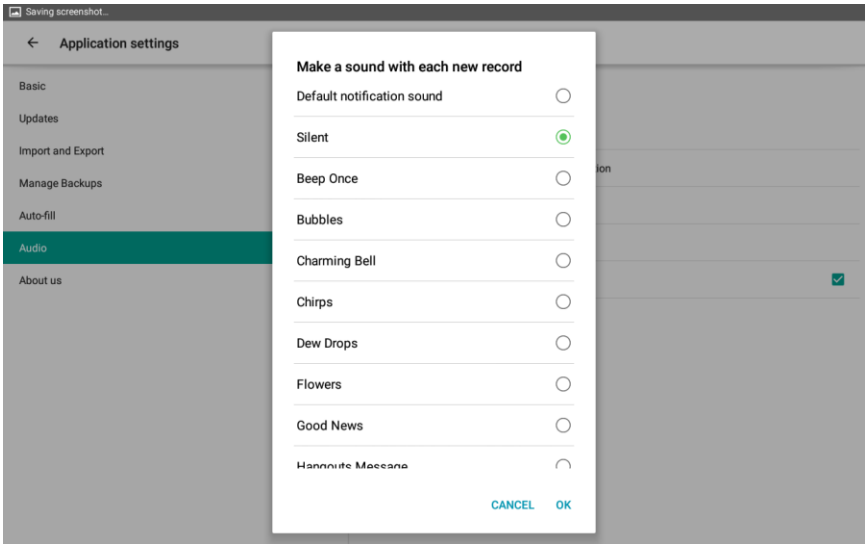


In the Decals section of Application Settings, you can select the decal definition file associated with your fish-board. It is important to select the correct decal if you plan on using hotkeys on the fish-board during your data-taking procedures. Hot-keys are outlined in the document titled "Custom Key-Mapping in the DCSLinkStream Android Application." In the Decals section of Application Settings, you can also update the decal definition files from the Big Fin decal definitions web-server if your tablet is connected to the internet.

Audio



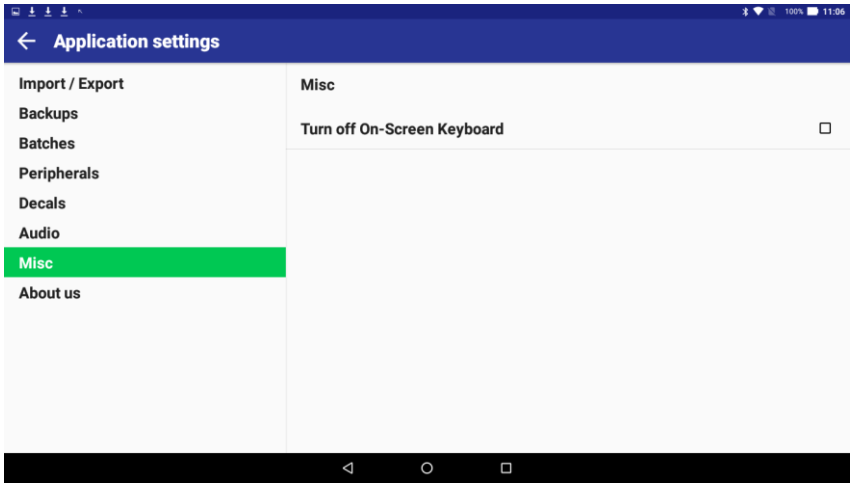
In the Audio section, the user can manipulate the audio settings of the application. Tapping any of the subheadings under "Audio" will bring the user to this screen:



For each subheading, the user can select a preferred sound for accomplishing the respective action. Note that DCSLinkStream also provides spoken-word audio feedback, which is controlled on a field-by-field basis.

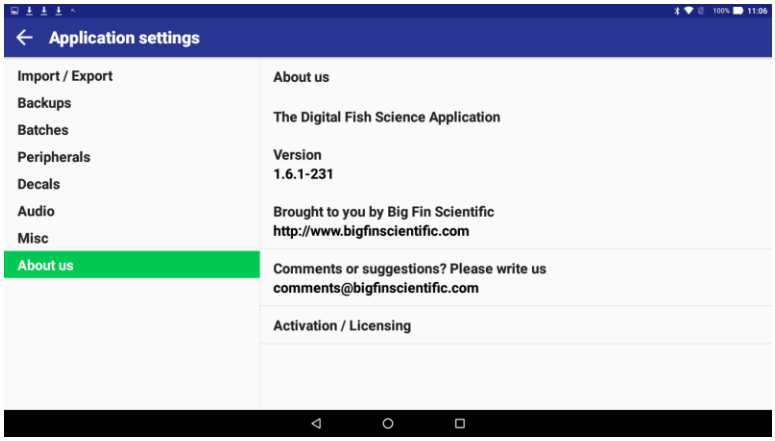
Note: *Whenever the application first boots up, the audio voice response will automatically initialize. This initialization usually takes about 5 seconds but can take up to 10 seconds. The side-effect of this is that sometimes the first record made in your study will not have the voice response triggered. This will occur if the study is visited quickly and a record is made before the initialization has completed. However, the second record and beyond will have the voice response.*

Misc



In the Misc section of Application Settings, the user can toggle the On-Screen Keyboard off and on. It is particularly helpful to turn off the On-Screen Keyboard if the user desires to use a Bluetooth keyboard and wants maximum visible of the application.

About Us



Here, the user can find the following information:

- Application Title and Version
- Big Fin Scientific Website (www.bigfinscientific.com)
- An email address for customers to send comments and/or suggestions

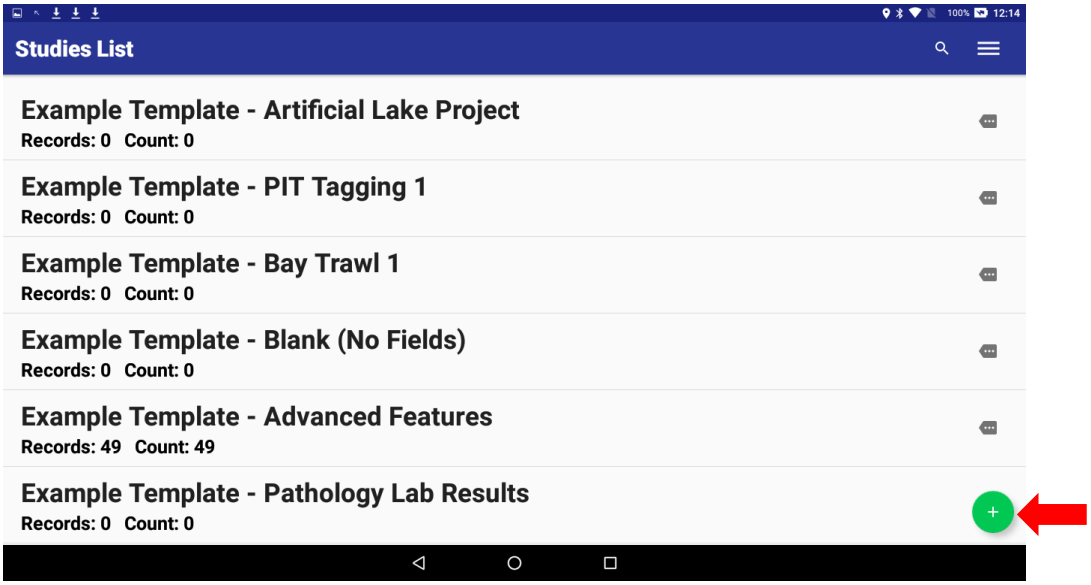
Study List

The study list contains a list of all studies you have created either manually or by importing the study. The study list allows general manipulation of the studies at a list level. The general intended approach to using study list is to create Study Templates and then duplicating them to create a new study based on the Template.

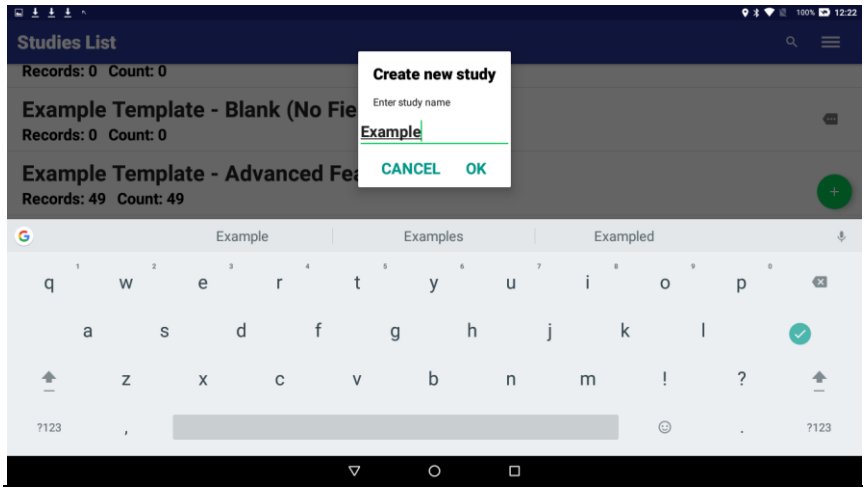
The following functions are allowed in this view:

- Add study – Accomplished via the + sign in the upper right of the action bar
- Rename study – Tap and hold a study, and then tap "Rename"
- Duplicate study – Tap and hold a study, and then tap "Duplicate" and specify a new name
- Delete study – Tap and hold a study, and then tap "Delete"

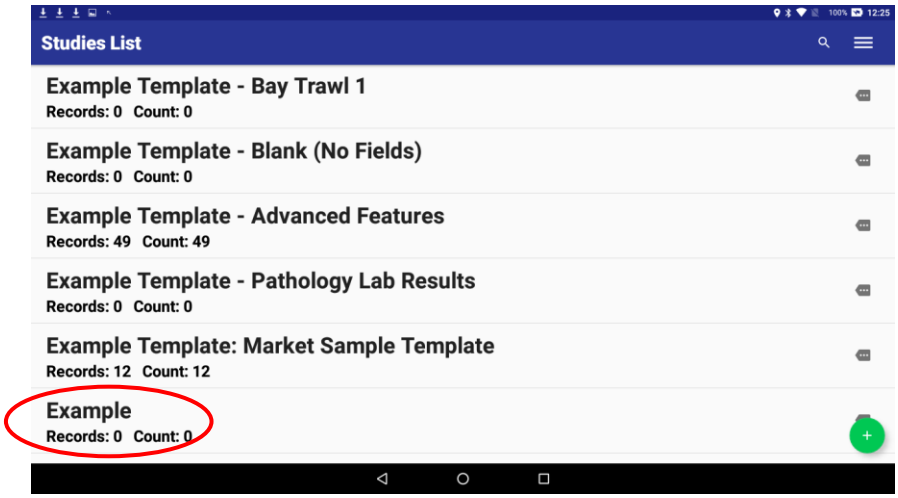
Adding a Study



Tap the + symbol in the bottom right corner of the screen



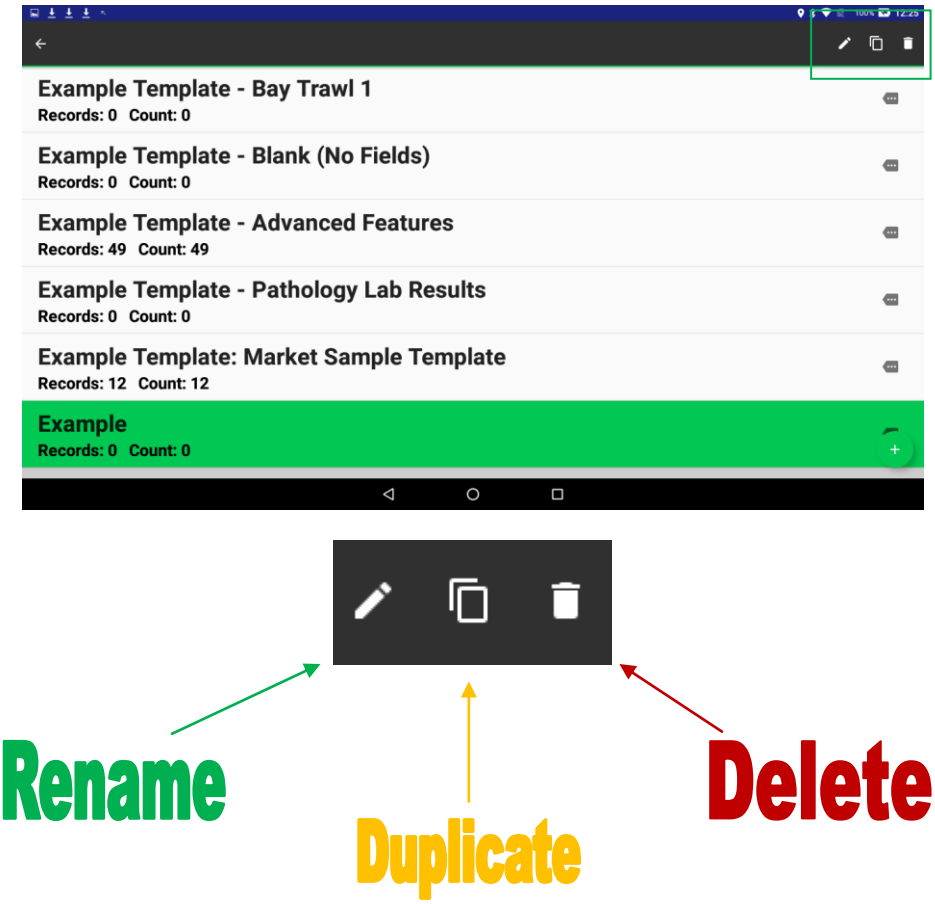
Enter the name of the study you wish to add. As an example, we'll add a study called "Example".



The Study that we just created will now be available on the Study List.

Renaming, Duplicating, and Deleting a Study

Tap and hold on a study you wish to rename, duplicate, or delete. The study will highlight green and then icons will appear in the top right corner of the screen as shown in the picture below:



Starting from the left, the pencil/stylus icon allows you to Rename the study. The double box icon allows you to Duplicate the study. The trash-can icon is for Deleting the study. If you tap and hold, you can highlight and delete multiple studies at-once.

Navigating Between Study Settings, Batches, and Measurement View

In the release version v1.6.0 and above, there is a new and easier to use navigation scheme for switching between the three main data pages: Study Settings, Batches, and Measurement View. The user can easily switch between these three pages using the selector switch in the top corner of the screen shown in the picture below.

- SS – Study Settings
- BA – Batches
- MV –Measurement View

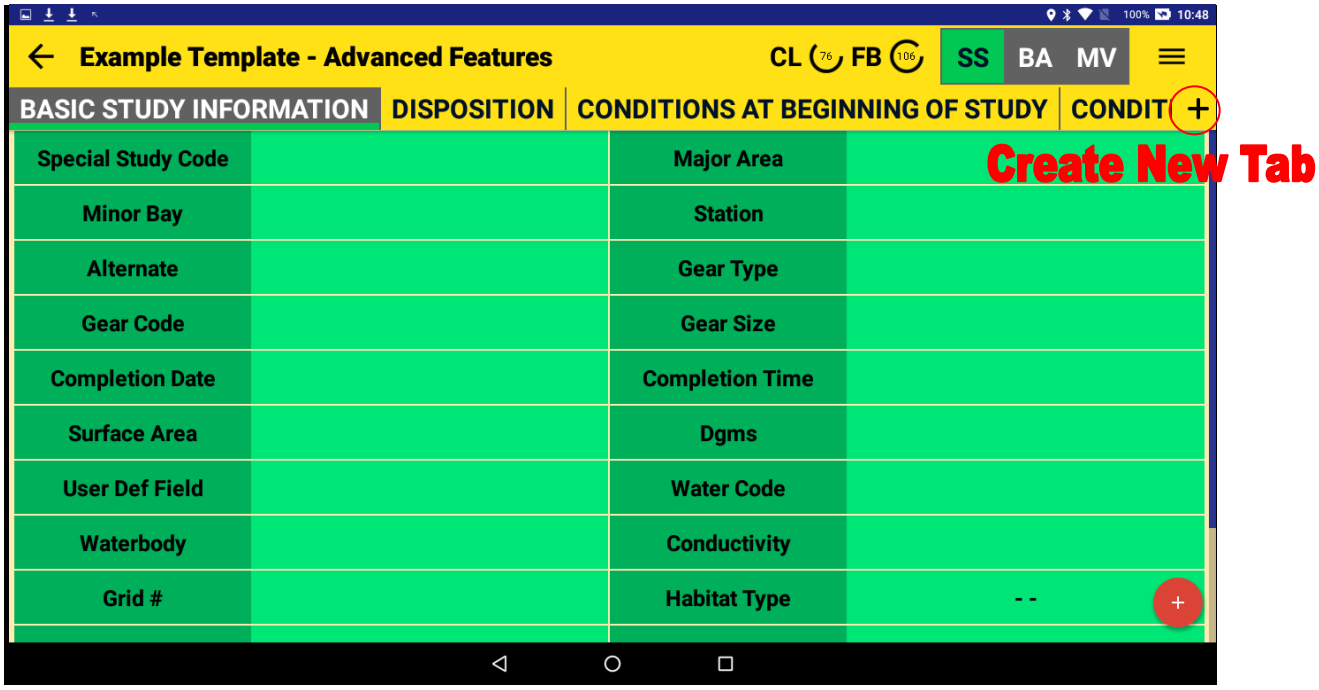
Whichever selection is highlighted in green is the page that the user is currently viewing. (tap to change)

Study Settings

The study settings page contains all the study-specific fields and data which is not changed on a fish-by-fish basis. Examples: gear type, vessel name, start time, and start location.

The study settings can be given custom tabs which can be added by tapping on the black "+" along the status bar. In this example, the Study Settings are divided up into 4 tabs:

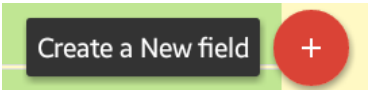
- Basic Study Information
- Dispositions
- Conditions at Beginning of Study
- Conditions at End of Study



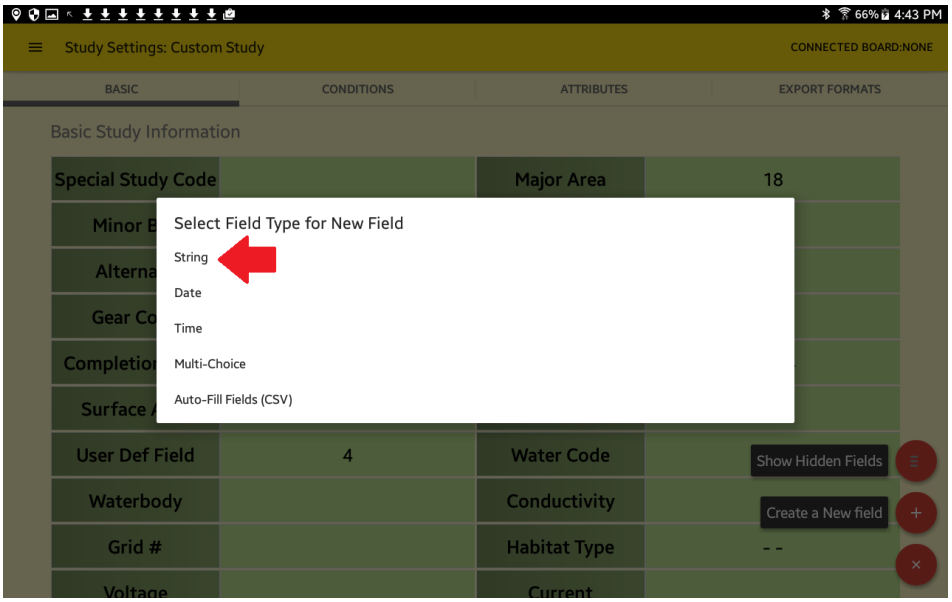
These fields represent some basic information about your study. Any field that is not filled out will appear blank in the CSV study-settings exported file.

Adding a New Field

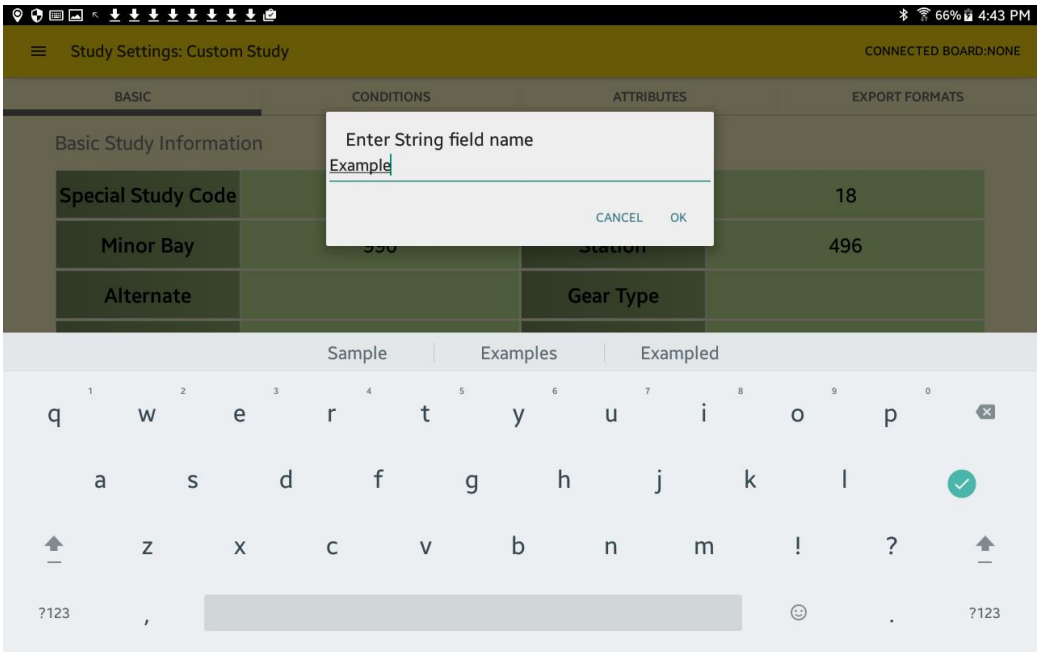
Tap the + symbol in the bottom right corner of the screen, and then tap the + symbol again labeled "Create a New field".



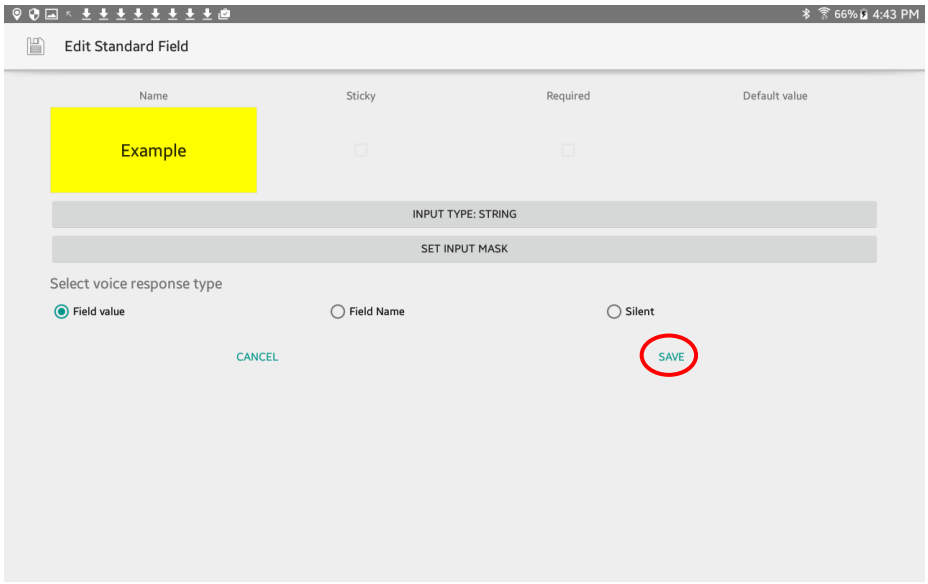
Here, the user can proceed to add a new field or view hidden fields. First we will cover adding a new field, so tap the + symbol labeled "Create a New field".



The user can select the field type. For this example, tap "String".

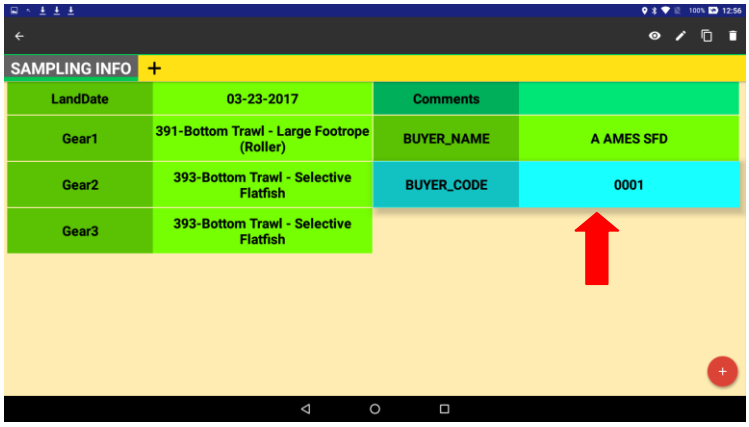


Enter the name of the new field. We'll call our new field "Example." Next, Tap OK.



Now select your preferred voice response type and tap "Save" to continue. By default, the field will appear on the tab that is currently open. You can easily move the field to another tab by putting it on the hidden list and then adding it to the appropriate tab by un-hiding it with the tab open. For more information about the types of fields the user can create, refer to the Types of Fields Explained section.

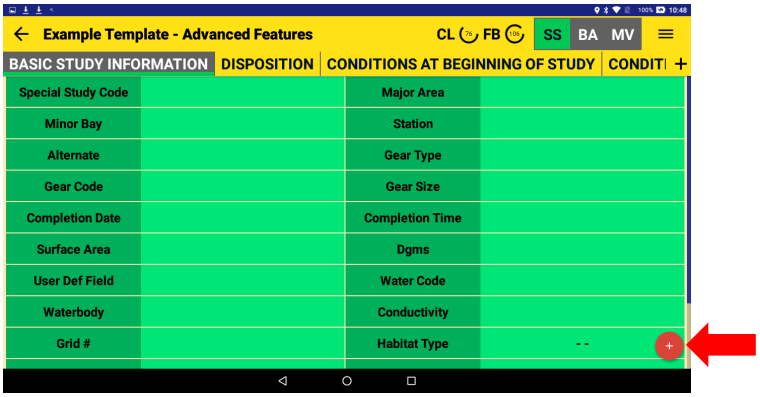
Hiding an Existing Field



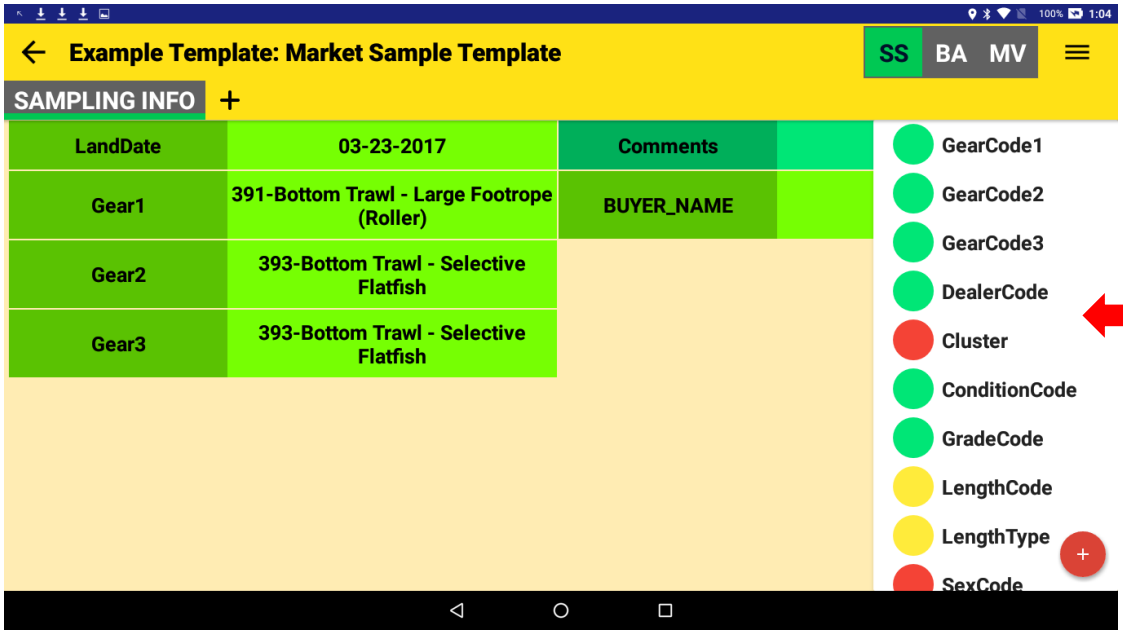
In this example, user is not interested in seeing the BUYER_CODE field because it is filled automatically through an imported auto-fill list when BUYER_NAME field is changed. The user tap-holds on the desired field and then taps on the Eye ( ) icon in order to hide the field. There are also command icons to edit, delete, or duplicate

the field. Refer to the Study List section of this document to see which icon responds to each command. For even more information on this, refer to *Measurement View User Interface* section of this document.

Viewing Hidden Fields



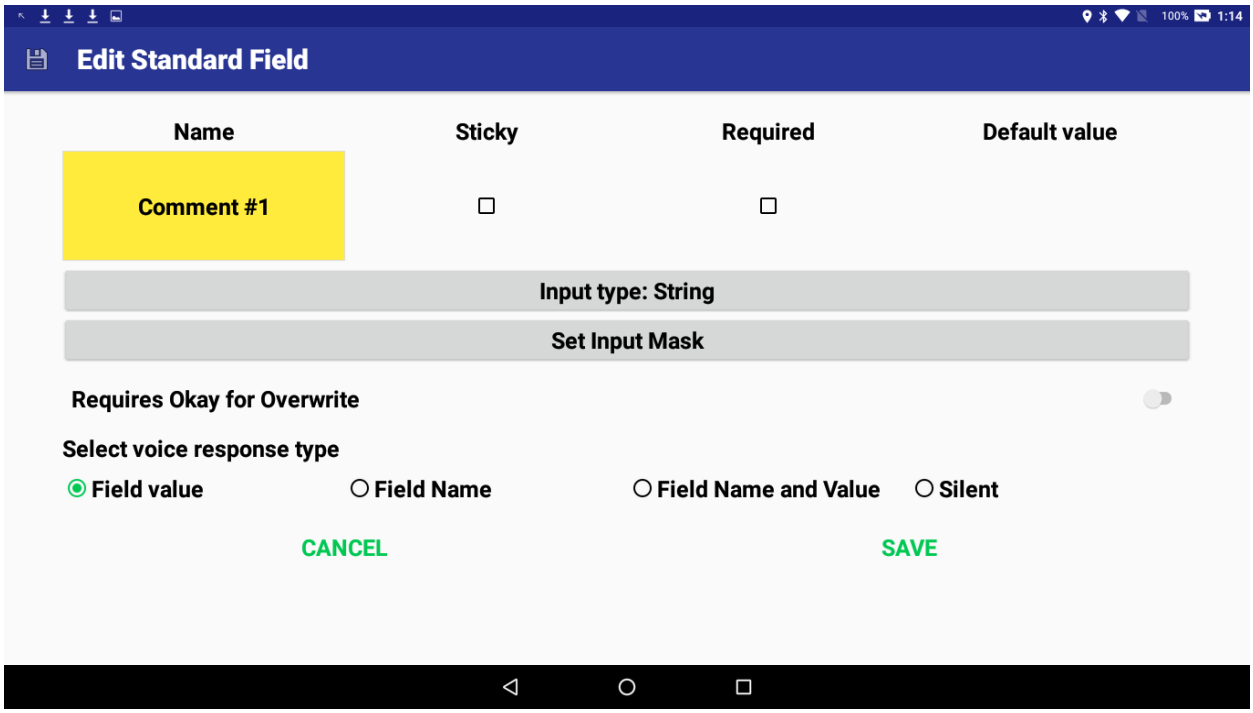
In order to see what fields are on the hidden list, tap the '+' symbol in the bottom right corner of the screen and then tap on the 3-bar symbol labeled "Show hidden fields".



A window populated by all of the hidden fields will appear on the right hand side of the screen. You can then place one of the hidden fields as visible on the current screen by tapping the field on the hidden list.

Field Attributes

When you create a new field, you're presented with a variety of attributes you can adjust. The attributes can change according to field type, but the most common are shown below:



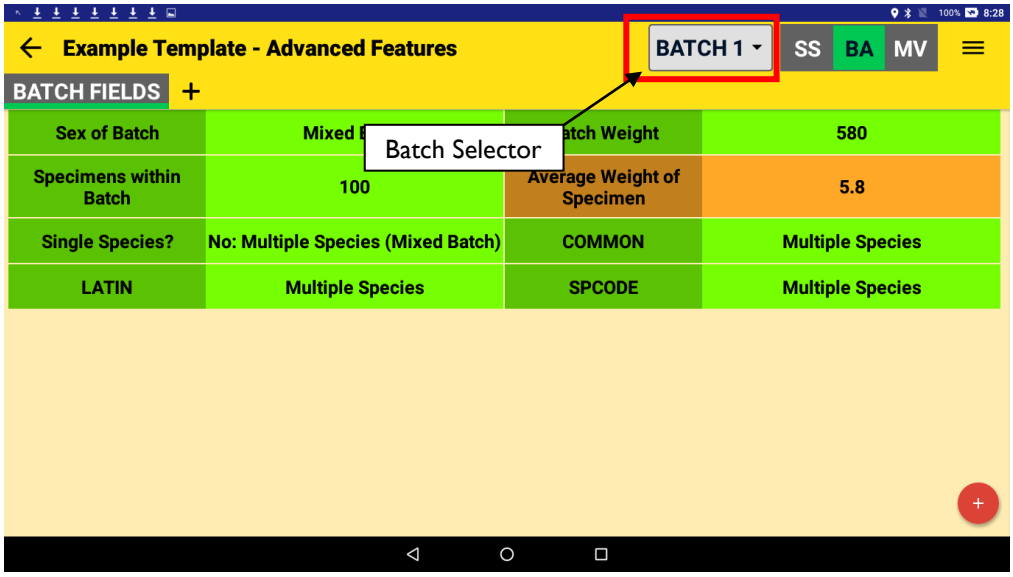
Selections

- Sticky – This means that the value, once set, stays-put until changed. This function is useful for attributes that don't change very often. If "Sticky" is not selected, the attribute value will revert to the Default Value if the Default Value is populated or BLANK, if not, at the start of every fish record.
- Required – This means that this attribute must have a valid value before the fish-record can be completed and written to the database.
- Default Value – The value to which the attribute reverts at each record, unless the attribute is set to another value and set to sticky.

Color Scheme

- Yellow – neither sticky nor required
- Green – sticky, but not required
- Red – required (may or may not be sticky)
- Purple – Aggregate/Math field types that perform distribution calculations on data
- Orange – Calculator Field types that perform custom user-inputted calculations on record data in real time

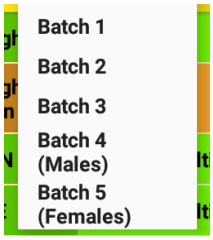
The Batches Page



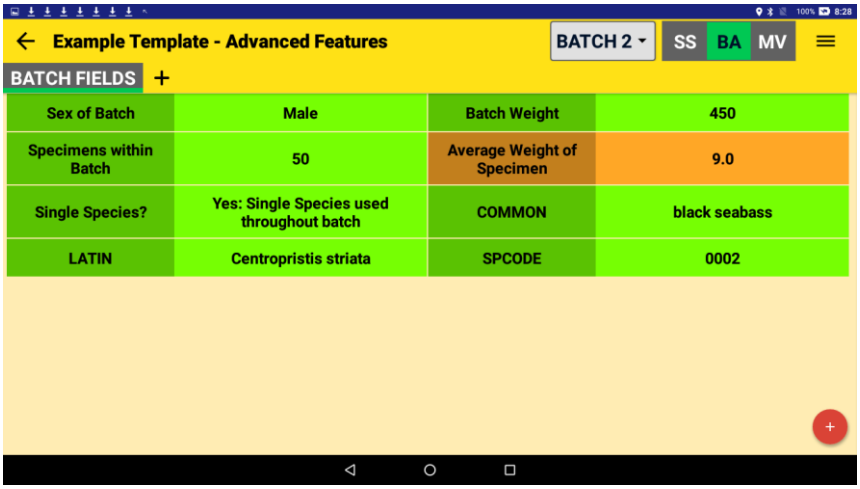
The Batches page represents an intermediate layer of data between Study-level fields and Individual Records fields. Batches are a way to gather data about groups of individuals within the study.

Note: Individuals can belong to one or more Batches. By default, they're only allowed to belong to one. In special cases, you may want an individual to belong to more than one Batch. You can turn on "multi-batch" behavior with a setting in App Settings/Batches. (see below). Leaving this behavior off is recommended in most cases.

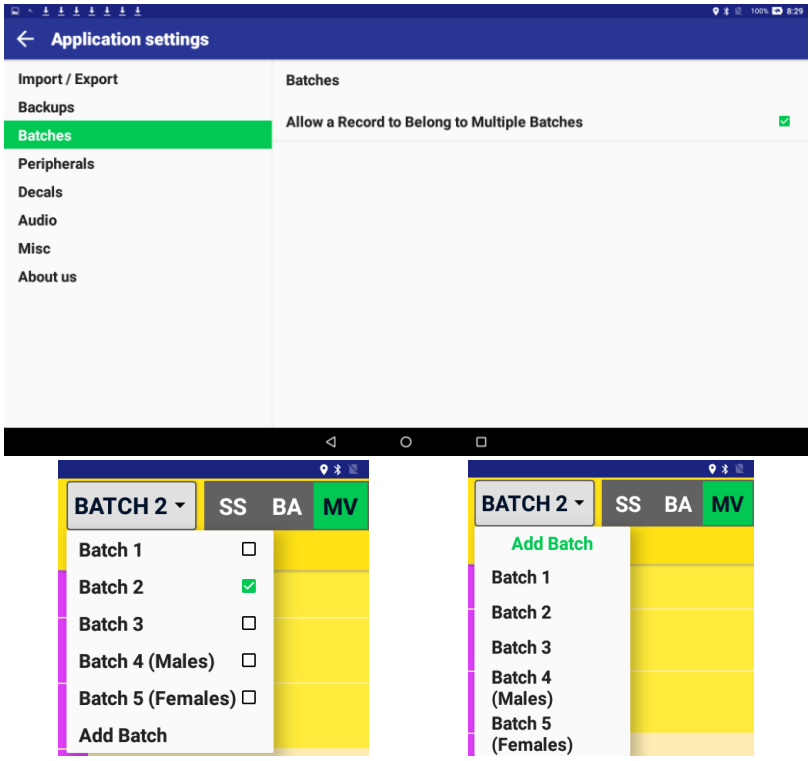
The BA screen contains the Batch-level field information. You can create many batches within any Study. Like the Individual Records, every Batch will contain the same fields but unique information can be placed in these fields for each Batch. Batches can be changed or added by tapping on the Batch selector at the top of this page. This will display a list of all Batches within the Study.



In this example, 5 Batches are already made for this study.The currently shown Batch can be changed by tapping on this selector and then selecting a different Batch. In the following picture, the user has switched from Batch 1 to Batch 2.



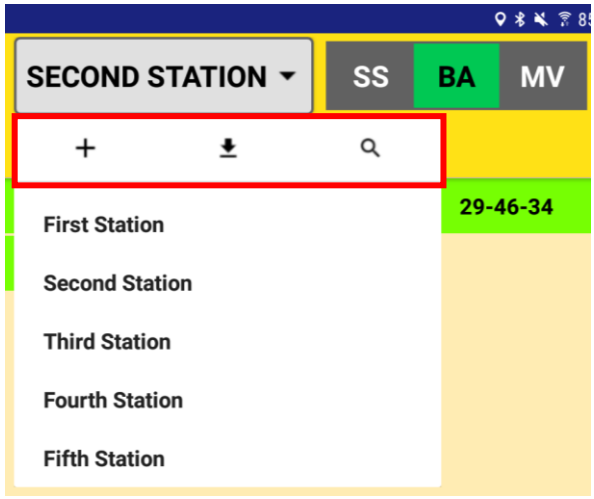
Note that Batch 2 has the same field names but contains different field values than Batch 1. While on the Measurement View screen, there are two different modes for entering records into Batches. One mode allows the user to input a single record into multiple Batches at once while the other mode only allows a record to be placed into a single Batch at a time. The mode can be changed by going to the Batches section in the Application Settings which is shown in the picture below.



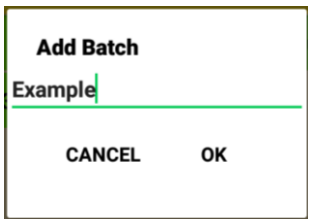
In Measurement View, the batch selector picks which batch(es) that the current record will be placed in. The record list will only show records within the currently selected batch(es). On the left picture, you see the

behavior of the Batch Selector when multiple batches are allowed and on the right, where only one Batch is allowed per Individual Record.

Manipulating Batches



If the user taps on the Batch selector while on the Batch page, there are three functions that can be used at the top of the selector. If the user taps the "+" button marked with the red arrow, then a new custom named batch can be added to the list. This can be done multiple times as user adds more batches one by one.

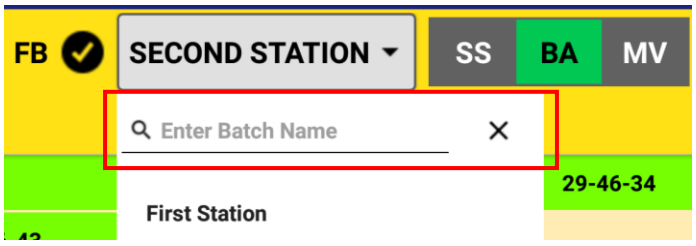


However, if a user wants to add a large amount of batches to the study, then the Import Batches via CSV function should be used. For example, if a user separates batches by species and has over 10 species of fish, then it may be more convenient for the user to import a CSV file filled with the pre-named batches than if the user added each batch individual through the application. After tapping on the ⬇ button marked with the purple arrow, the users will be presented with a file browser to find the CSV file that they would like to import.

	A	B	C
1	Batch #		
2	Catfish		
3	Sea Bass		
4	Tarpon		
5	Shad		
6	Garr		
7	Red Drum		
8	Grouper		
9	Tuna		
10	Sea Turtle		
11	Shrimp		
12	Oyster		
13	Shark		

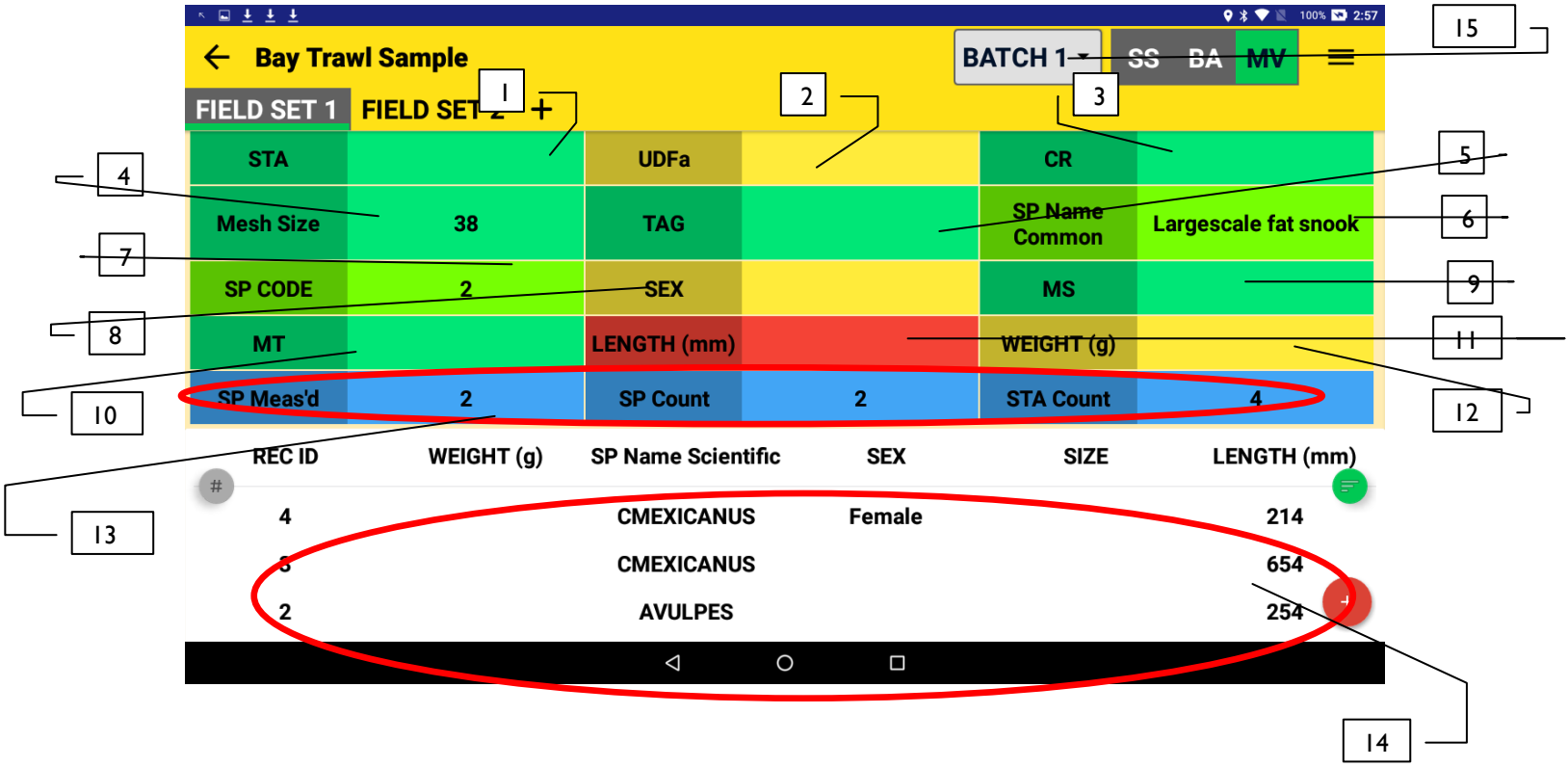
Using the file browser, the user can find their CSV file and import the batch names from it. The picture on the right shows the format that should be used for the batch CSV file import. Notice that the first row contains the title "Batch #." The **first row of the CSV file is ignored** when importing. The first batch that will be made will be named "Catfish" from this example followed by "Sea Bass" and so on.

If the user has a large amount of batches, it can be difficult to hop between batches if selecting the batches right from the list. In cases like this, the user can use the search batches functions by using the 🔍 button indicated with the green arrow from the screenshot above.



The user can start typing the name of the batch that they would like to jump to through this search batches function.

The Measurement View



Example Template: Field-Set 1 Descriptions

Note: Field-Sets are a group of animal record characteristics, or fields, which are grouped together. You can swipe the field-set (tab) left or right to access other field-set tabs as well as create your own.This is just an example study, your fields may be different than what's shown.

1. STA - Station Field - Alphanumeric - This field contains the user's Station code or description.

2. UDFa - Specification of the UDFa selection box - Alphanumeric - This is a customer-specific field and can be ignored if it means nothing to you.

3. CR - Capture or Release Field - Drop-Down Choice of "C" or "R" or Blank - Designate the fish record as one for which the fish was captured for further study, released after measurement or blank for no designation.

4. Mesh Size – Numeric – This field will auto-populate if you're using a Gear List. Whether or not you're using a Gear List, you can change this value at any time, should you change your gear during your study.

5. TAG - PIT Tag or Manual Tag number - Alphanumeric - This field contains the tag number of the fish which is being recorded. This can be a PIT tag which is recorded from a PIT-tag reader-device via Bluetooth connection or entered manually from a visual tag.

6. SPEC - Species Field - Alphanumeric - This field holds the name of the species being recorded. You can enter this manually or it can be Auto-Filled when you enter a Species Code, if you've loaded a Species Name v. Code List to the study. To learn more about Auto-Fill fields, review the *Types of Fields Explained* -> ***Auto-Fill Field Types (CSV)*** section of this document.

7. SP CODE - Code of the Species being Recorded - Numeric - Enter the Species Code which corresponds to the species you intend to record for this fish-record. If you use the Auto-fill feature, the Species Code can be filled-in for you when you enter a species name. Alternatively, again if you're using Auto-fill, entering a Species Code in this field will cause the Species Name to be updated to match the Species Code you enter, according to the Auto-Fill rule you set in the settings (Common vs. Scientific).

8. SEX - Sex Field - Drop-Down List of 4: Male, Female, Unknown, Blank - Designate the fish-record as either Male, Female, Unknown or Blank/"no evaluation provided".

9. MS – Maturity Stage – Alphanumeric – Intended for a maturity stage code.

10. MT – Measurement Type – Drop-Down List including "Standard, Fork and Total". Other measurement types will be available in the future. *To request one be added for your needs, please write us with a name of the MT and description at: service@bigfinscientific.com*

11. LENGTH - Fish-Length Field - Numeric - Use the fish-board to mark a fish-length or enter a mm value manually.

12. Weight - Enter the weight of the specimen or the count - Numeric - Enter the gram weight of the specimen being recorded. *Note:This weight can be "pulled" from a Bluetooth-enabled scale which has been connected to the application via the General Settings. Select "Get from Scale" in the dialogue to poll the scale for a value and populate the field. The select "OK" to accept the value received from the scale.*

For instructions on connecting the fish board to the scale, please review the Connecting Peripherals guide available for download at www.bigfinscientific.com.

13. The blue fields circled here are Tally fields, indicating the following tallies of fish:

- STU Meas'd→ The # of animals which have been measured in the study.
- STA Meas'd→ The # of animals which have been measured in the study at the Station which is currently showing in the Measurement View. Changing the Station field can be done at any time and will cause STA Meas'd to change to reflect the measurements made at the newly designated Station.
- SP Meas'd→ The # of animals which have been measured in the study of the Species which is currently showing in the Measurement View. Changing the Species field can be done at any time and will cause SP Meas'd to change to reflect the measurements made of the newly designated Species.

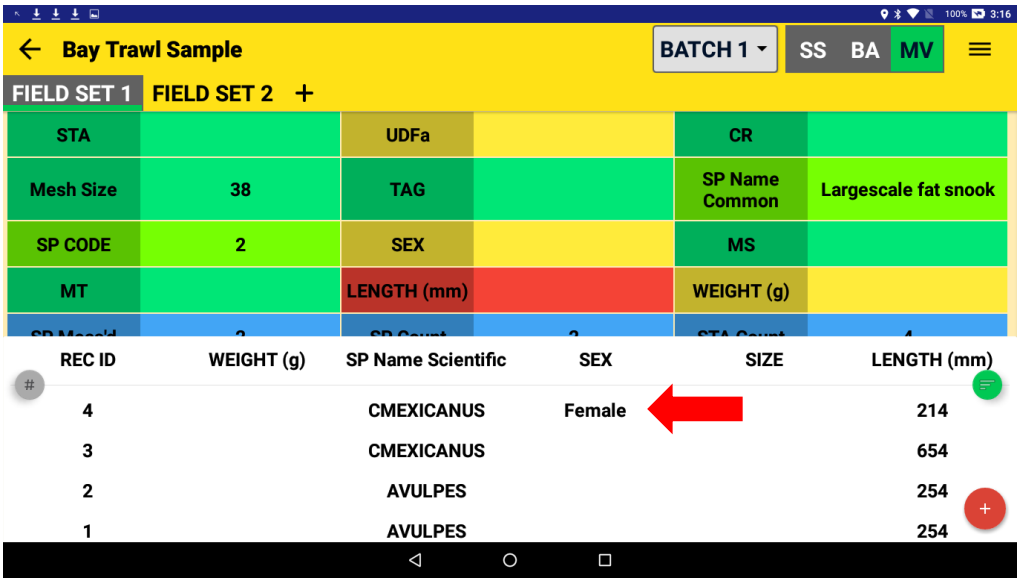
14. This area is a scrollable table view of the fish-records. Only a portion of the record fields are shown and, in the future, you will be able to designate which fields are shown in the table views. The CSV output file of the fish-record database will contain all the fields, not just those which are shown here.

15. This is the Batch Selector. It allows the user to select which Batch the current record will be placed in. The Record list will also show only the records that are part of the current Batch that is selected. Multiple batches can be selected at once.

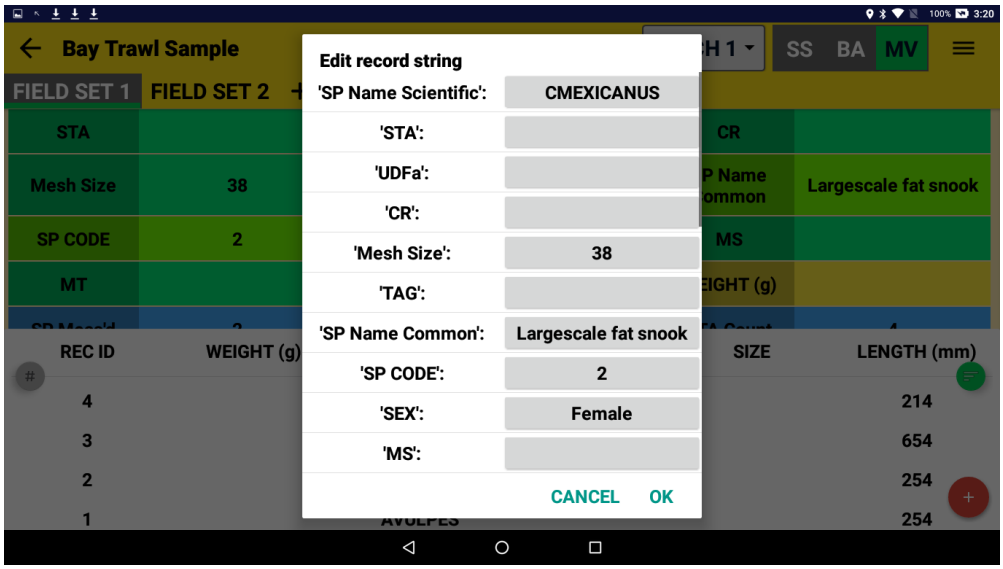
Tapping and holding an entry allows the user to perform the following actions:

- Count – manipulate the count for a specific entry.
- Move – move the record to another study.
- Print – Print label (only applicable to users with a connected label printer).
- Delete – delete an entry.

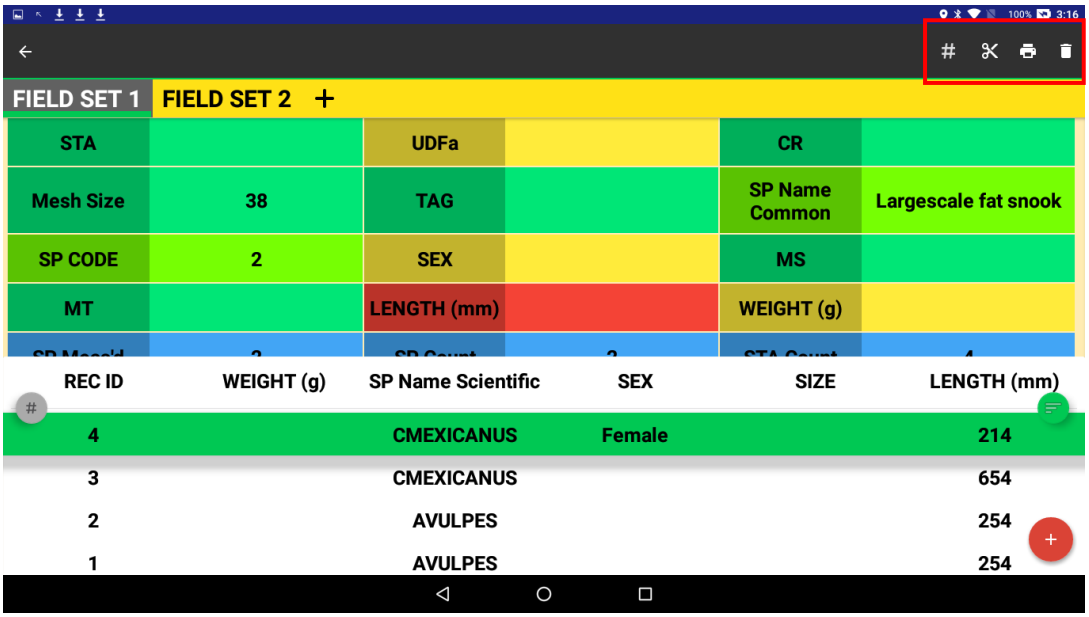
Example: Editing an Entry

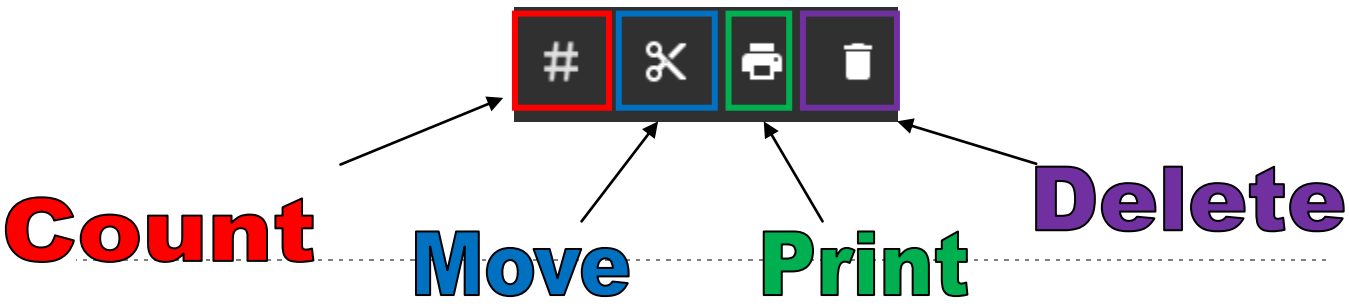


Let's say you wanted to edit the first entry shown in the screenshot above. Simply tap on the record row and an 'Edit Record' dialog will display as shown below.



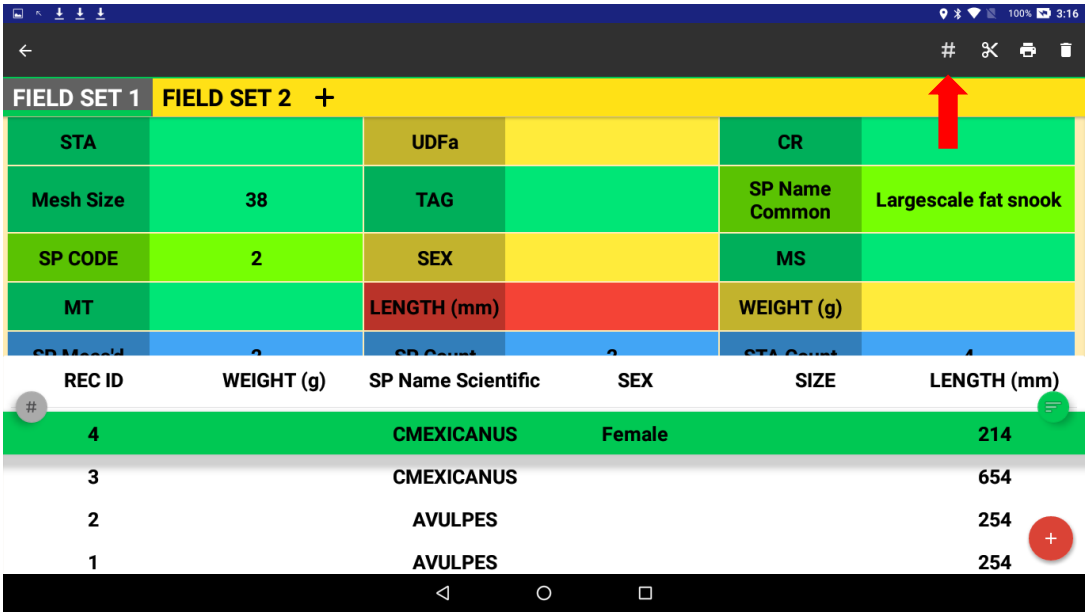
There are more options as well. If the user tap-holds on the record and highlights it, some icons will appear in the top bar:



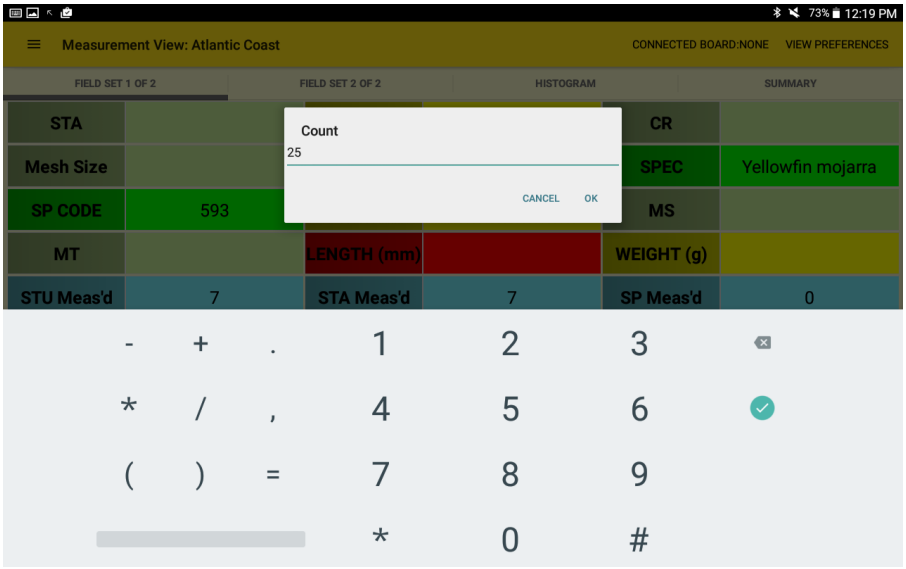


After tap-holding and highlighting a record, the user can tap on any of these 4 icons on the top right corner of the screen to perform the actions shown above on the highlighted record. Once the user is in tap-hold mode, multiple records can be highlighted and moved or deleted at the same time.

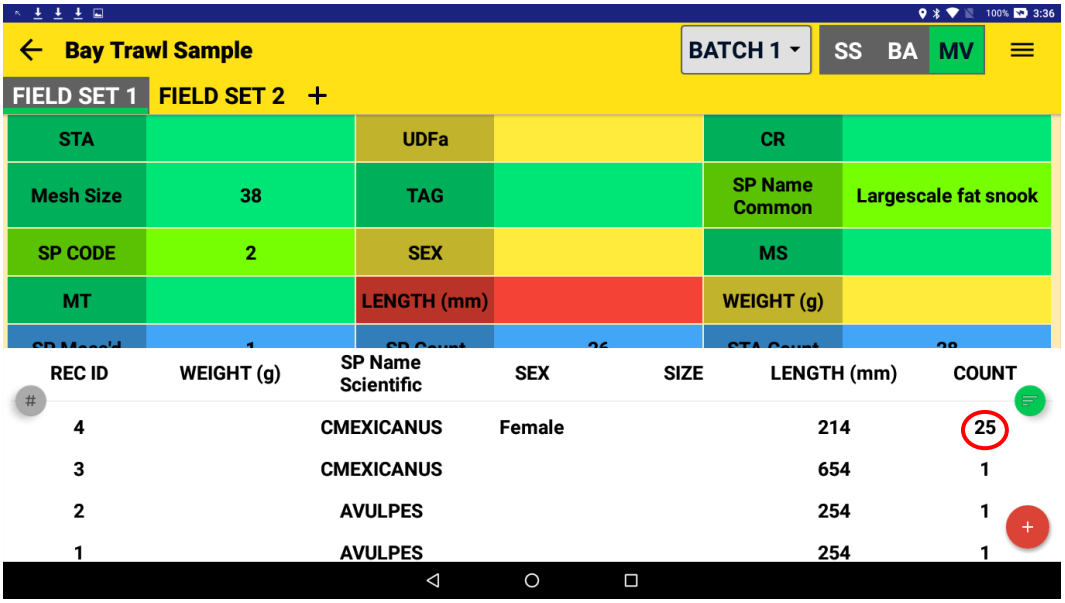
Example: Count



The Count function lets you manipulate the "count" for an entry. An example for a situation in which this function would be useful is discussed on the following page. For now, tap the "Count" icon.



Enter a number that indicates number of fish measured that have the attributes and measurements as that of the fish in the entry, and then tap OK.

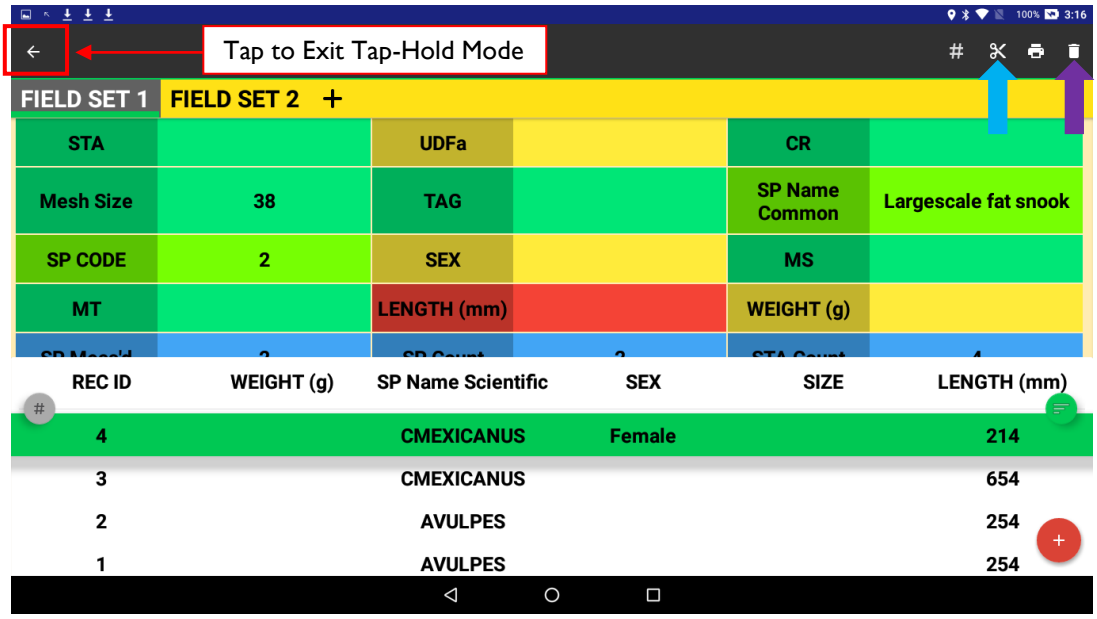


Notice that the count for the entry is now 25 instead of 1.

Example of use: Your study requires a trawl-catch for a certain duration in a certain location, from which qty 20 of Species A are required to be length-measured. In addition, the study requires that any specimen in-addition to the length-measured qty 20 of Species A be recorded simply as "caught" (but length measurements are not required for those specimens). You catch 50 of Species A in your trawl and set about recording the catch. In this scenario, you'd record 20 records of Species A which would have length measurements associated. At the end of the 20 specimens, you'd "Add Count" of another 30, which would only have the fields you'd filled-in, but not with length data (unless, of course, all the lengths were exactly the same).

Deleting or Moving an Entry

After tapping and holding an entry, tap the "Delete" icon to delete the record or tap the "Move" icon to move the record into another study. Multiple records can be tapped on and moved or deleted at once after entering the tap-hold mode. To exit the Tap-Hold mode, simply press the arrow in the top-left corner, press the back button on the tablet or left-swipe on your fish-board.

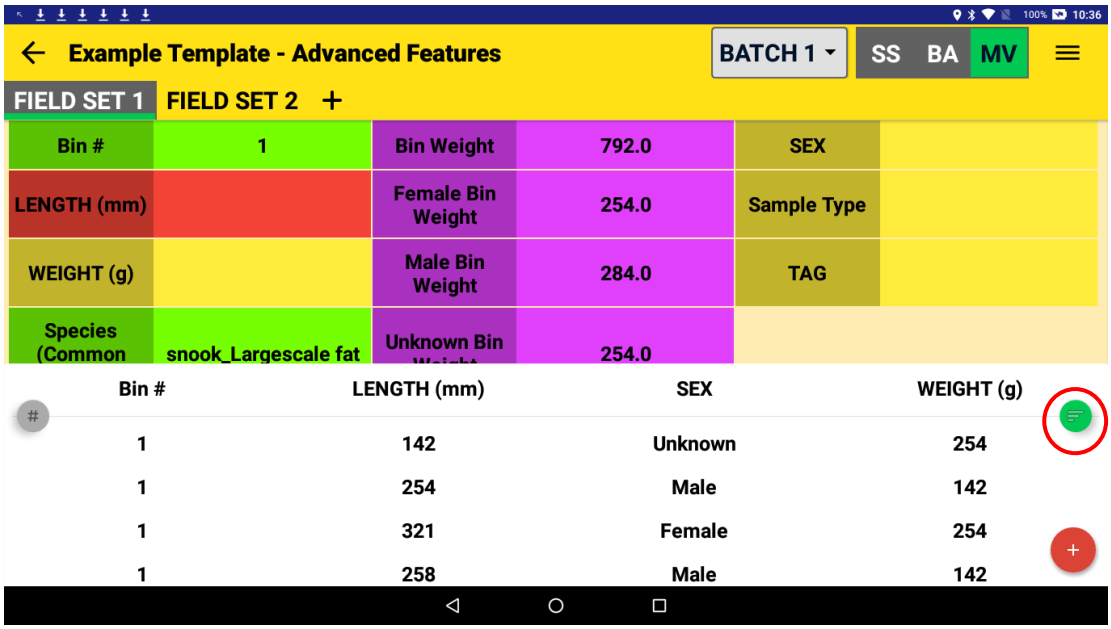


Measurement View Record List Field Header Manipulation

You can manipulate the order and presence of the field columns on the records list at the bottom of Measurement View, as well as which fields show in which tabs.

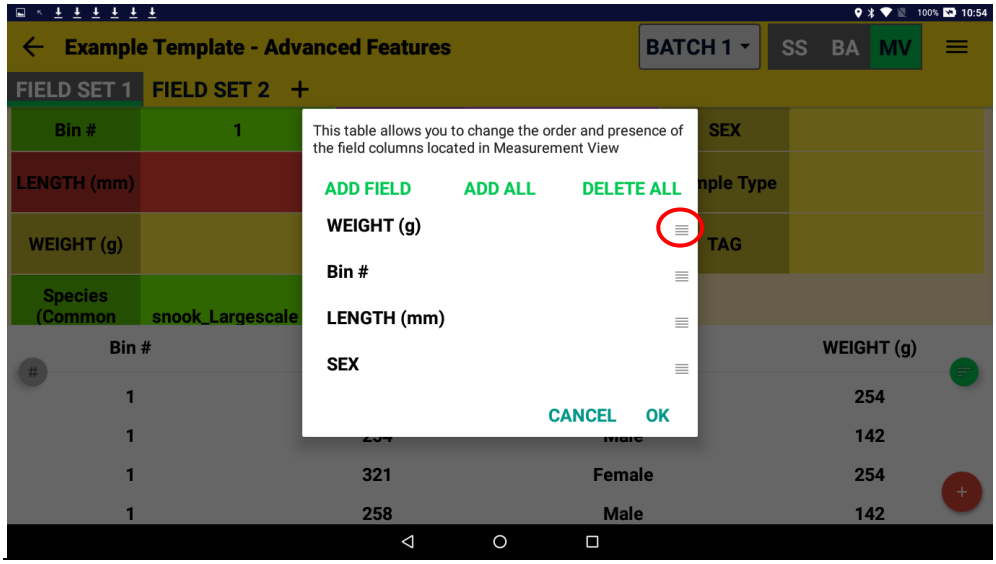
You can:

- Change the order of fields
- Add a single field
- Add all fields
- Delete a single field
- Delete all fields

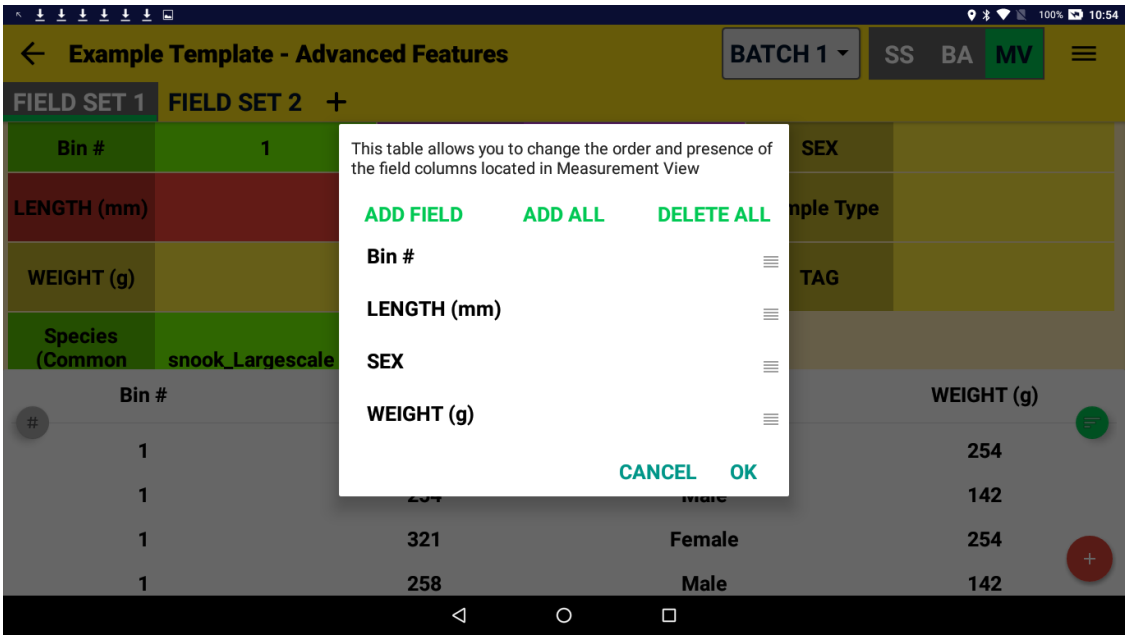


This is accomplished by tapping the 3 bars of decreasing length (top → down) indicated by the red circle in the screenshot above.

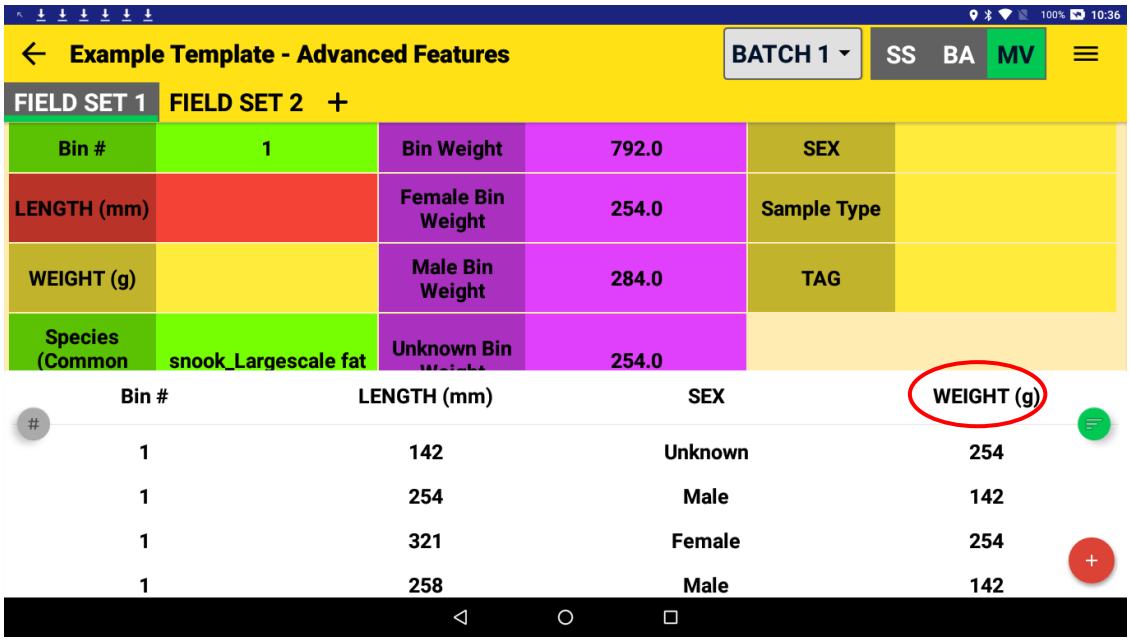
Changing the Order of Fields on the Records List



Let's say you wanted to make "weight" the last very last field. Tap and hold its 3 horizontal bar icon directly and drag down to the bottom of the list.

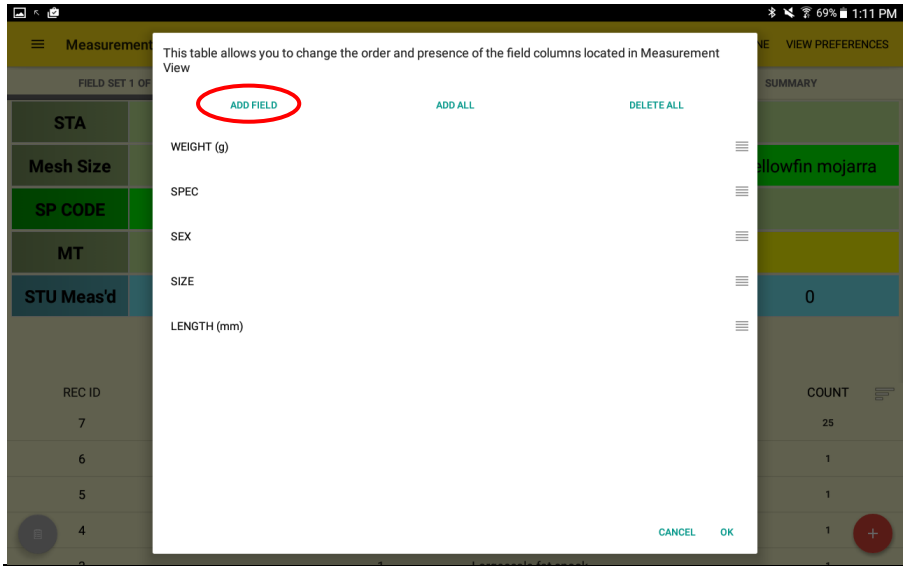


Tap OK, and now the "Weight" column will be the last one shown on the Record list at the bottom of the Measurement View.

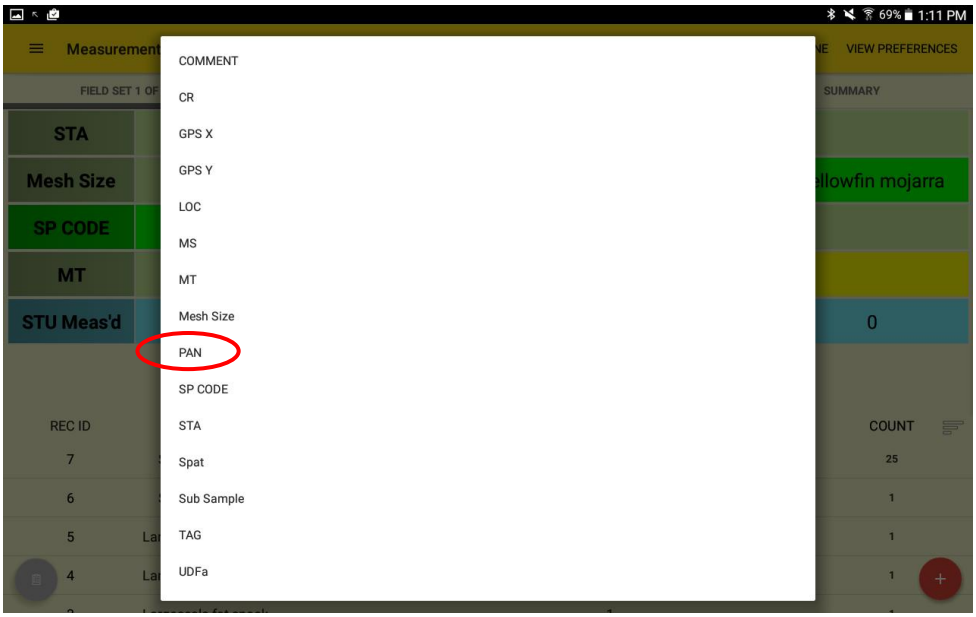


Adding a Single Field on the Records List

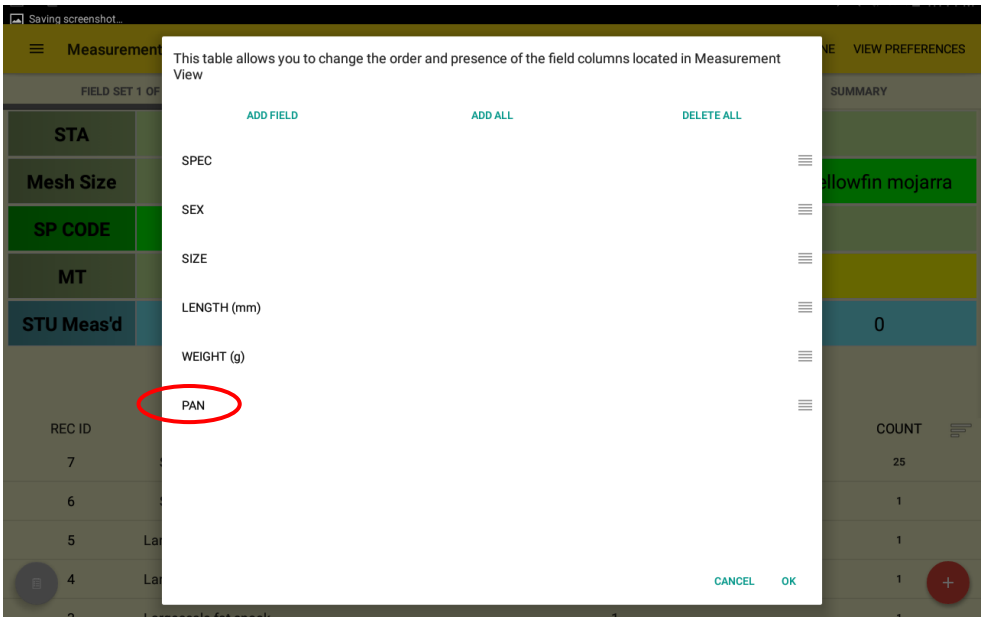
Tap the 3 horizontal bar icon again.



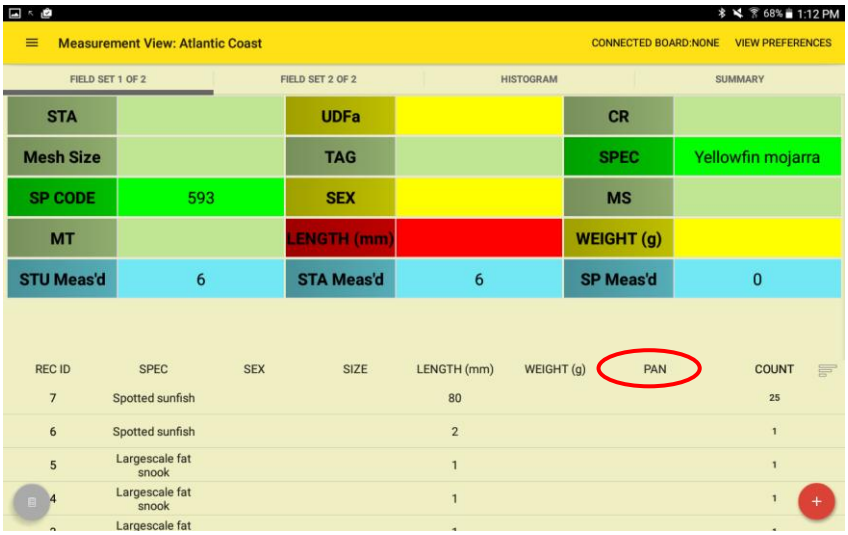
To add a single field, tap "Add Field".



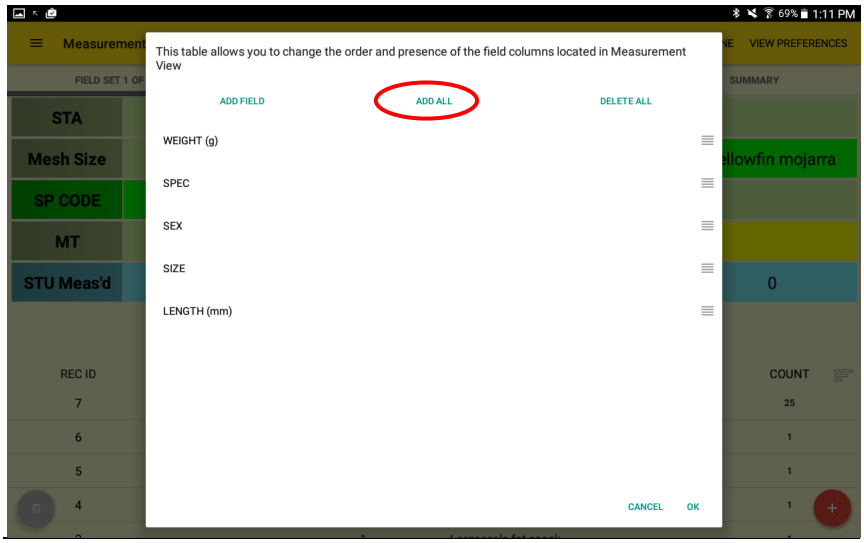
A list populated by all available fields will appear. Tap whichever field you wish to add. For example, tap PAN.



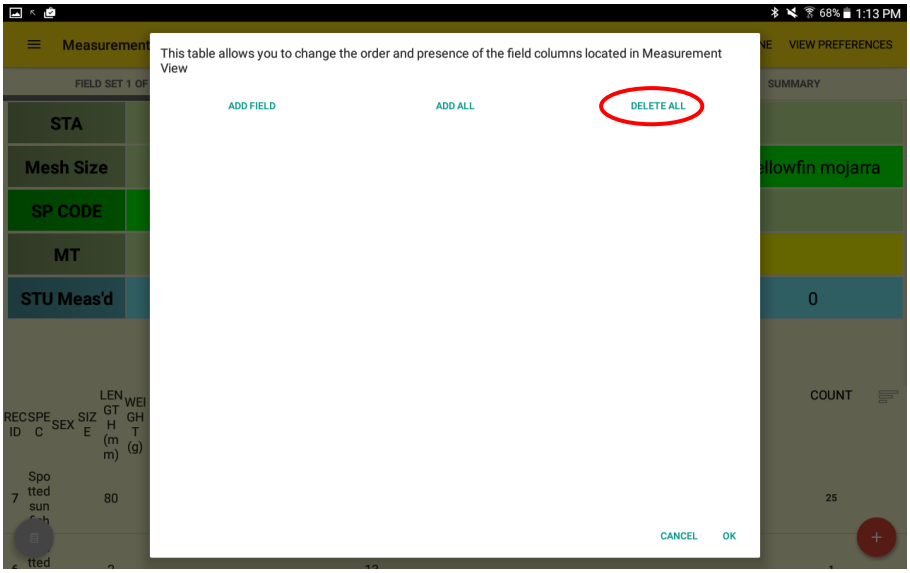
Pan will be added to the Field List as well as to Measurement View



Adding and Deleting All Field Headers on the Records List

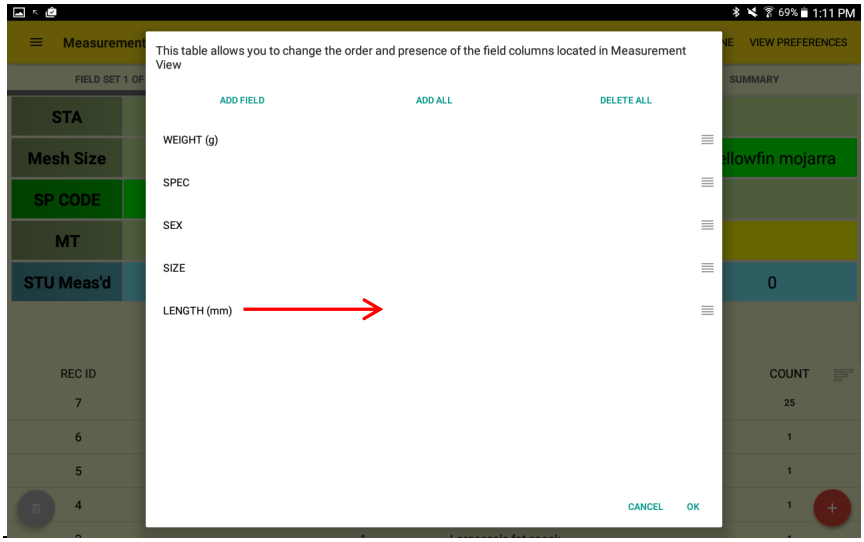


Tapping "Add All" will add every available field to the Field List and to Measurement View.

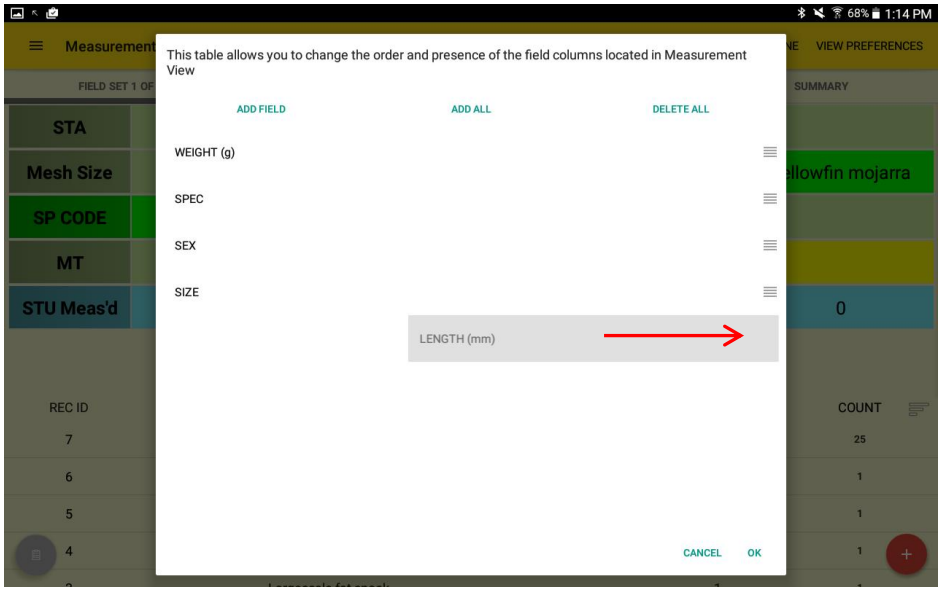


Similarly, tapping "Delete All" will clear the Field List and Measurement View of all fields.

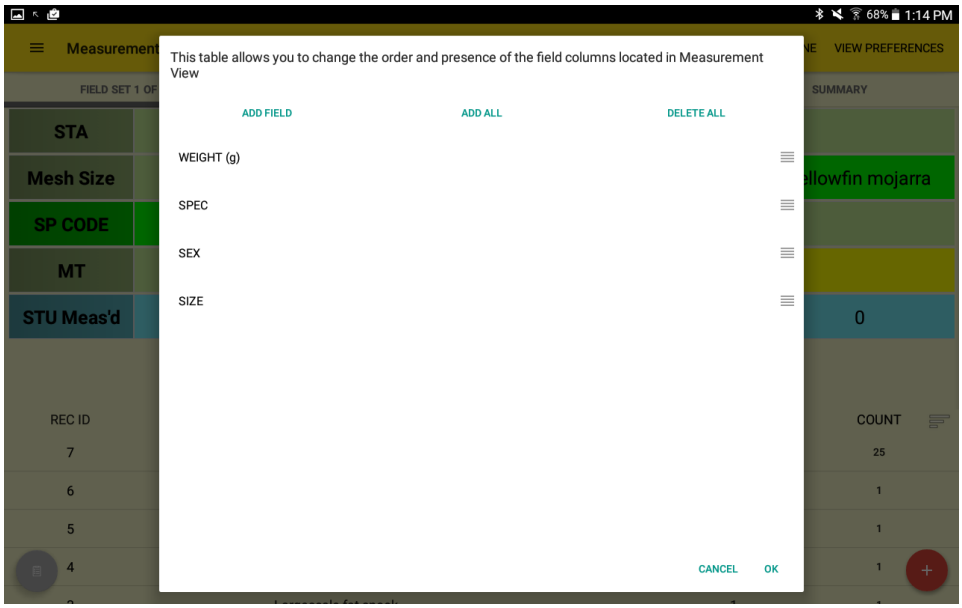
Deleting a Single Field on the Records List



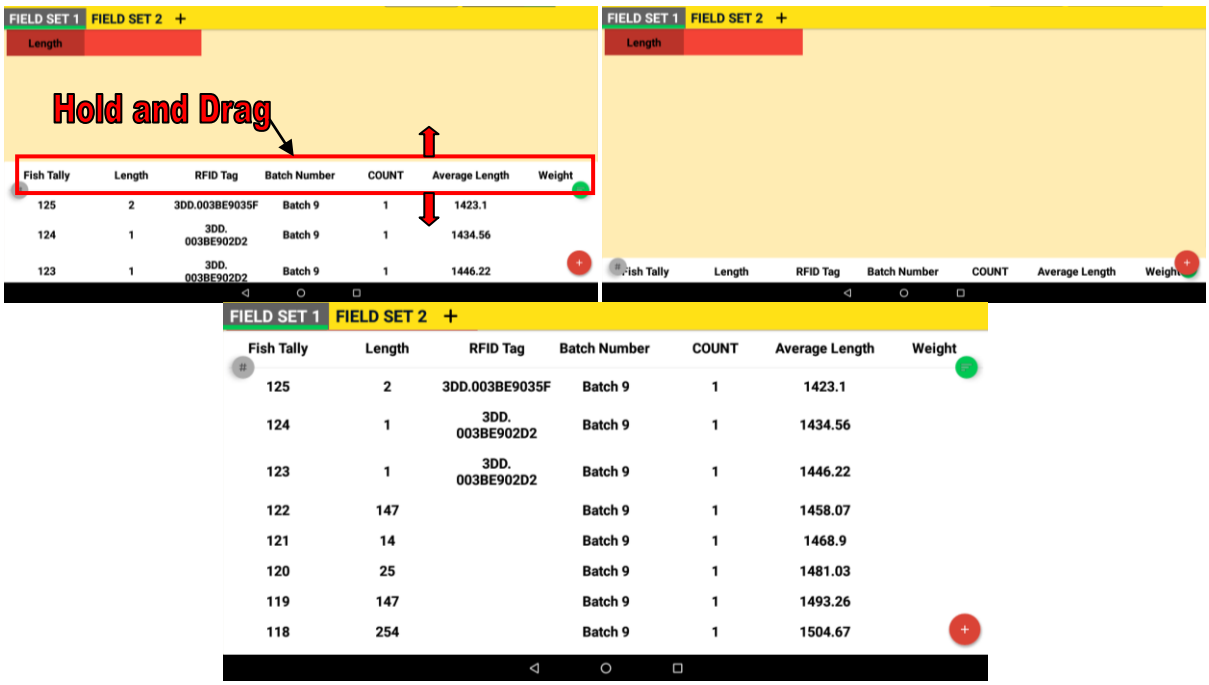
To delete a single field, tap-hold on the desired field and drag your finger horizontally across the screen. You can drag your finger left or right. Both instances will remove the field from the record list. For example, tap "Length" and drag it across the screen.



This action will remove "Length" from the Field List and the table in Measurement View



The record list located on the Measurement View page has three different view modes. The list can be dragged to fill the entire screen, half the screen, or off the screen for (only field headers displayed).



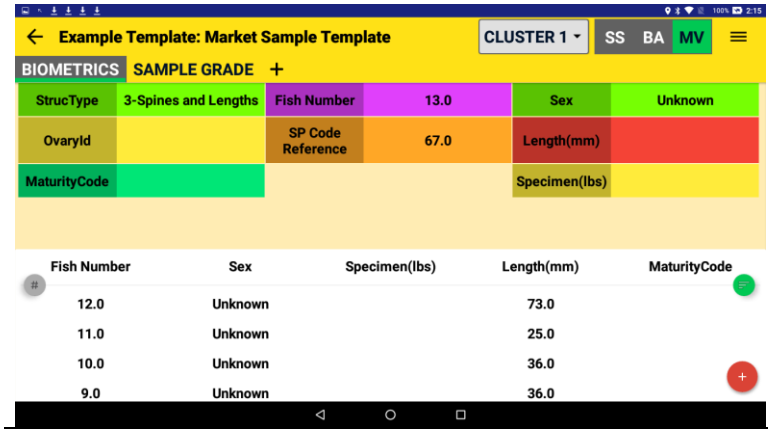
Measurement View User Interface

In all Field-box views (Study Settings, Batch and Measurment View), you can:

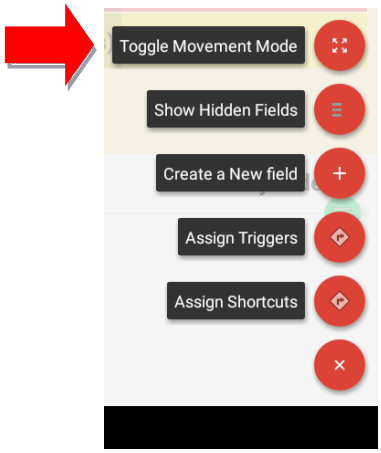
- Change the order of fields
- Delete a single field
- Hide a Field
- Edit a Field
- Duplicate a Field
- Create a Field

Change the order of the fields for the current record

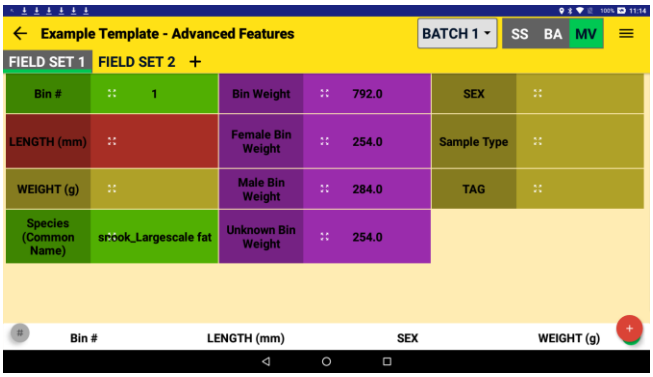
Making changes to the layout of your Measurement View is easy.



To move fields around, tap on the red "+" button in the bottom right corner and select 'Toggle Movement Mode.'

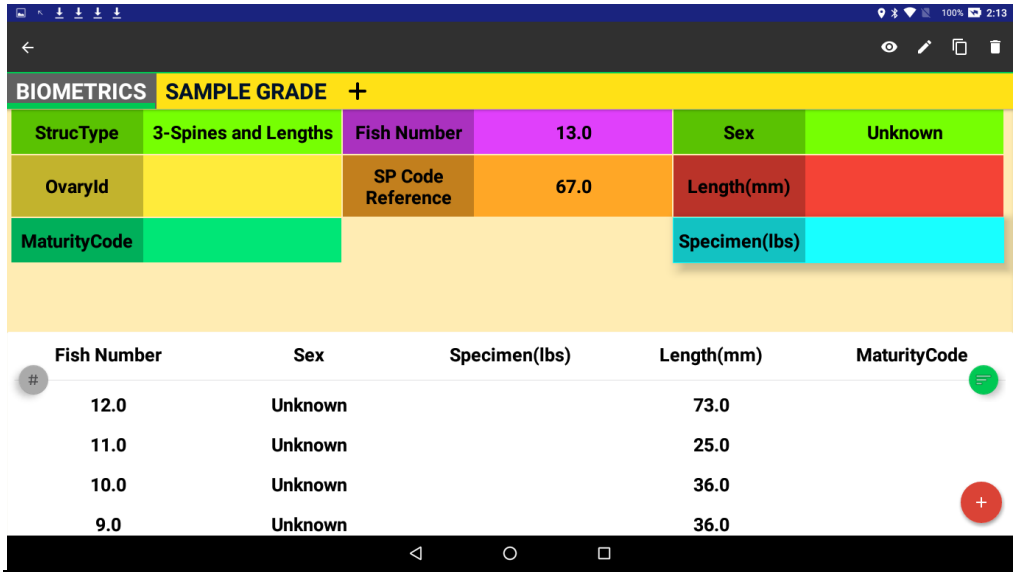


Now drag your fields around by tapping and holding, dragging and lifting your finger where you want the field to drop. When Movement Mode is on, fields are shown with the icon overlaid on top.

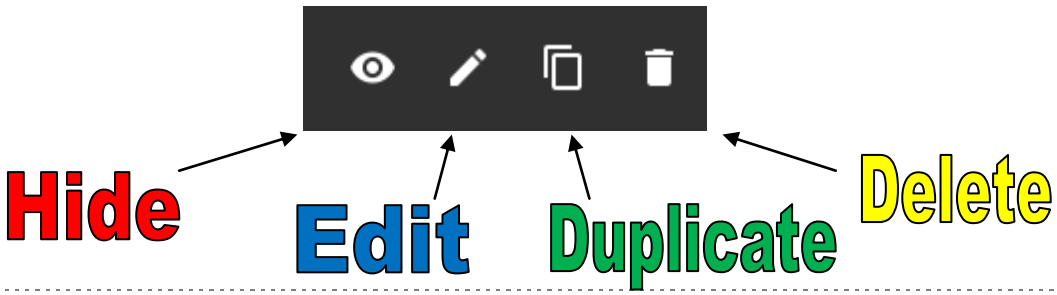


If you place a field on top of a field that is already present at the location, the two fields will switch locations. Select the 'Toggle Movement Mode' button on the list again to turn Movement Mode OFF when you are finished moving fields to the desired locations.

Tap-Hold Mode on Measurement View Fields

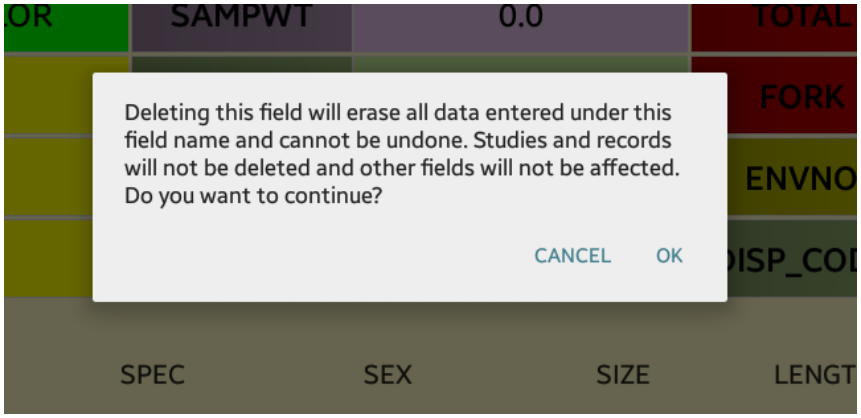


Tap-hold on fields located in Measurement View to highlight them and perform various functions. The picture below describes the functions of each of the icons during this tap hold mode.



Delete a single field

In order to delete a single field off of your measurement, perform the tap-hold on the field that you would like to delete and then tap the trash-can ( ) icon located at the top of the screen. Once you have tapped the delete icon, the application will flash the following message:



Once you see this message, tap "OK" and the field along with all of the data associated with it will be deleted from the record list. The records will remain in the database; however, the data within the field that you delete will be lost.

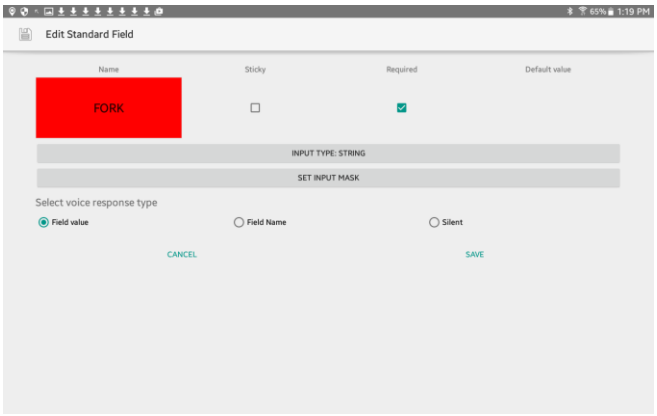
Note: this means that if you have 1000 records, each with data in the Species field, deleting the field will erase the Species field entry from those 1000 records. The 1000 records and the other fields and their entries will remain intact.

Hide a Field

You can hide fields that you don't want to see them (but still want them in the database). Perhaps they're driven fields, like auto-fill codes or tallies that you want in your exported data, but don't need to see as you're taking data. Tallies, Aggregates and Custom Equations will still update even if they're hidden (and be recorded in the database. Tap the eye icon to hide a field or multiple fields.

Edit a Field

Selecting the Edit icon after the tap-hold will bring up the following screen:



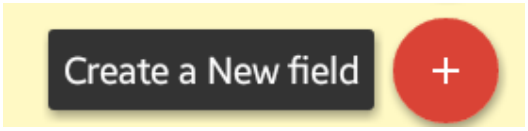
In this screen, you can add a default value for the field to revert to after every record. You can also set the field to required or sticky. Change the field input types, set an input mask, and also change the voice response that is triggered once the field has received a value. Rename the field by tapping on the colored box at the top left of the screen where the field name is. Different field types have different options in this screen, which will be covered more in depth in the 'Types of Fields Explained' section.

Duplicate a Field

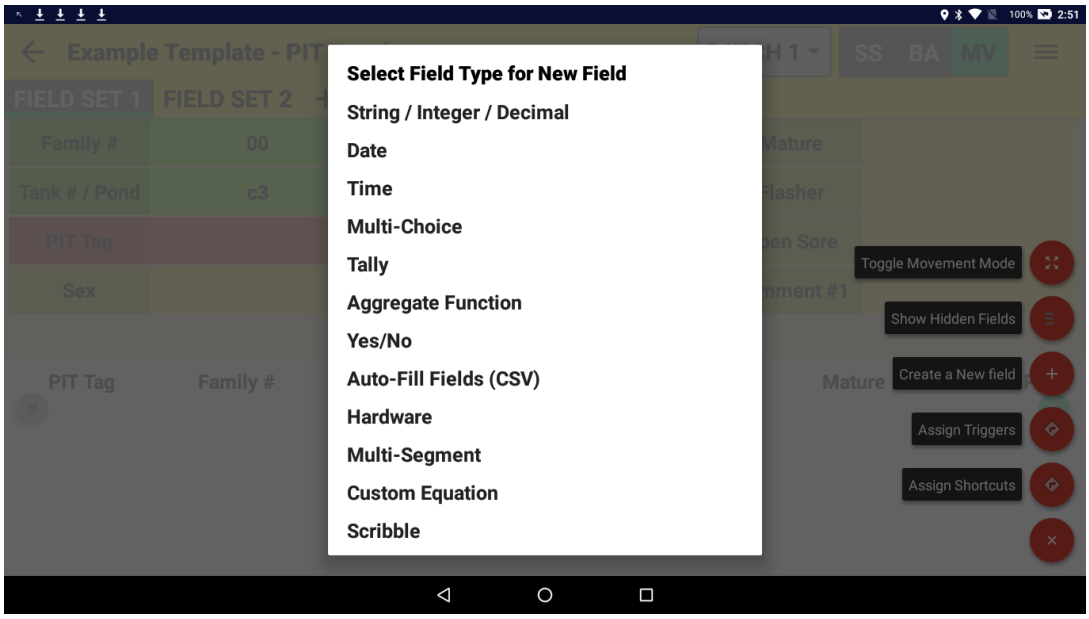
Tap on the duplicate icon in the top right corner. The field that is created will be named the same as the original field but with 'copy' at the end of the name.

Create a Field

Tap the red "+" button located in the bottom right corner of Measurement view. The red "+" will expand and show a list with options including 'Create a New field.'



Tap on "Create a New field' and then following dialog box will appear:



Choose the field type you would like to make, name the field, and then save it. By default, newly created fields appear at the bottom of the screen that's showing (Study, Batch or Measurement View).

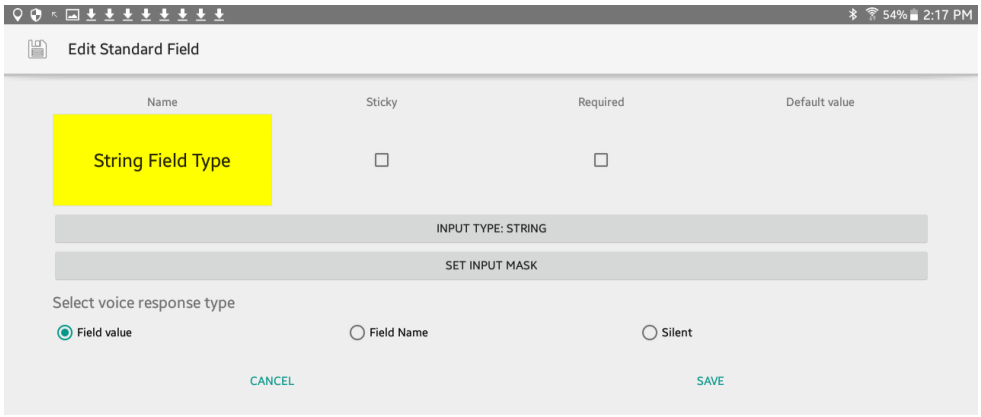
Types of Fields Explained

There are 12 different types of fields that a user can create on a custom level while in Measurement View. These field types are as follows:

1.) String/Integer/Decimal Field Types
2.) Date Field Types
3.) Time Field Types
4.) Multi-Choice Field Types
5.) Tally Field Types
6.) Aggregate Field Types
7.) Yes/No Field Types
8.) Auto-Fill Field Types (CSV)
9.) Hardware Field Types
10.) Multi-Segment Field Types
11.) Custom Equation Field Types
12.) Scribble Field Types

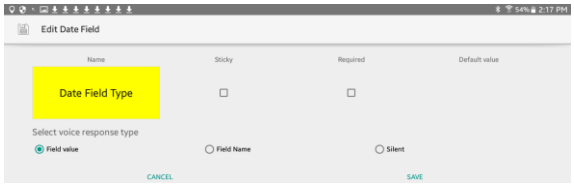
1.) String Field Types

The String/Integer/Decimal is one of the more basic and broadly-applicable field types. This type of field can be filled with any string value by manually typing it into the field box (or dialogue). Input mode can be changed to String, Integer, or Decimal while in the Edit Field screen by tapping on "Input Type".

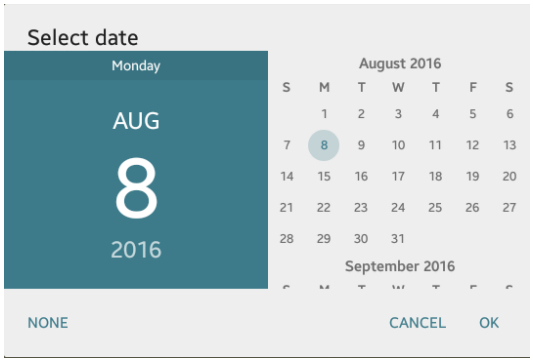


2.) Date Field Types

A date field type is a special-formatted field that allows user to input a date with ease through a calendar interface.

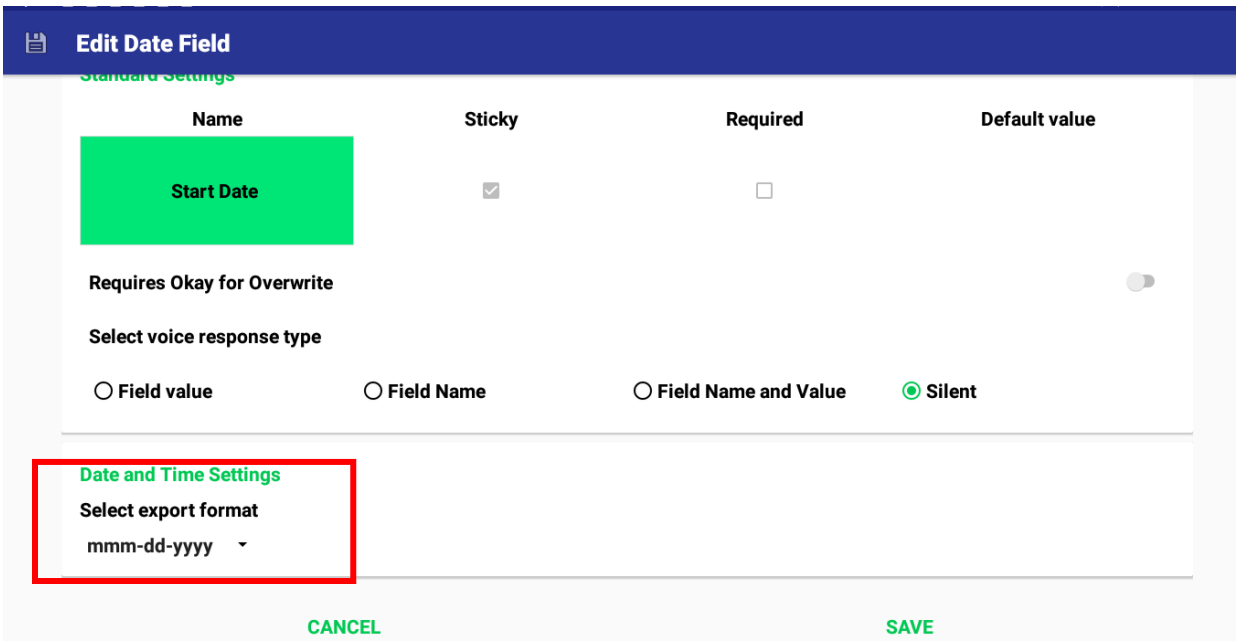


Once the date field type is saved and added to Measurement View, the interface looks like the following when the user selects a date:



Here the user can navigate between years and months to find a unique date of interest to.

Date field export formatting can be edited within the 'Edit Date Field' page.



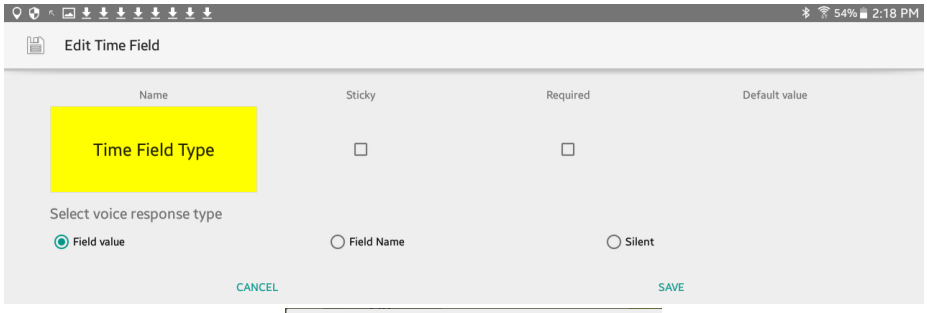
The following date formats are currently supported on exports:

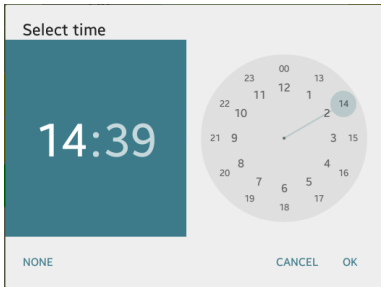
- mmddyyyy - (12252017)
- mm/dd/yyyy - (12/25/2017)
- dd-mm-yy - (25-12-2017)
- dd-mmm - (25-Dec)
- mmm-yy - (Dec-17)
- mmm-dd-yyyy - (Dec-25-2017)
- mmm-dd-yy - (Dec-25-17)
- dd/mm/yyyy - (25/12/2017)
- dd/mm/yy - (25/12/17)

If you require a date format that is not listed above, please write us at support@bigfinscientific.com.

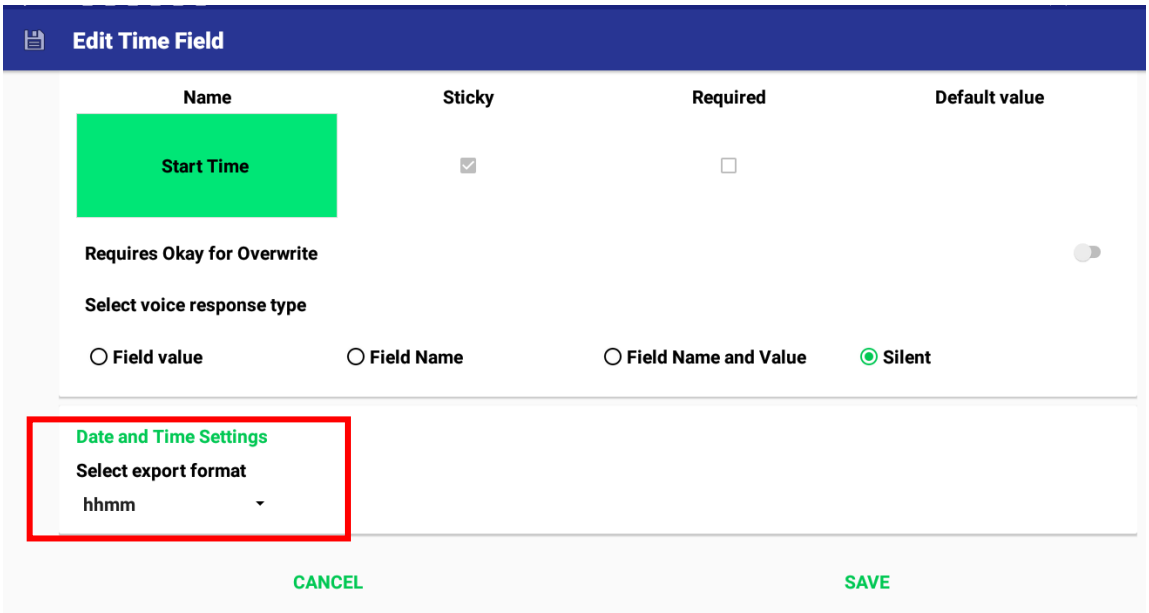
3.) Time Field Types

A specially formatted field for time which presents a clock dialogue during data-entry. Note that all records in the database include an automatic time and date stamp generated at the time the record is created.





Time field export formatting can be edited within the 'Edit Time Field' page.



The following time formats are currently supported on exports:

- hhmm - (24 hr format - 2235)
- hh:mm AM/PM - (12 hr format - 10:35 PM)
- hh:mm:ss AM/PM - (12 hr format - 10:35:00 PM)
- hh:mm - (24 hr format - 22:35)
- hh:mm:ss - (24 hr format - 22:35:00)

If you require a time format that is not listed above, please write us at support@bigfinscientific.com.

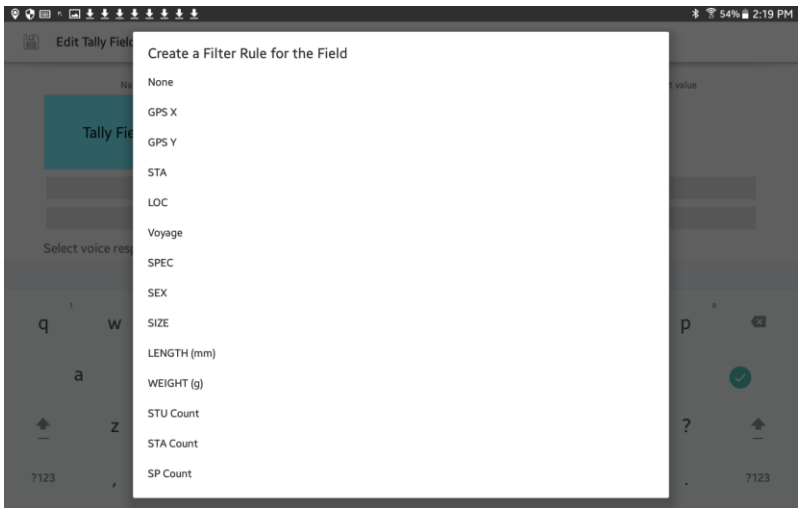
4.) Multi-Choice Field Types

A multi-choice field type allows you to define a list of selections that you can later select from a dropdown list when the field is selected.

More selections can be added to the list by tapping the 'Add Item' located in the bottom left of the window. For this example, we may be interested in the Sex of the fish. So, we define the first choice as Male and the second choice as Female by tapping on the dark gray rectangle that says 'Click to Change'. When this field is selected on Measurement view, the Male and Female options will be displayed as a drop-down list. The items on the multi-choice list can be easily edited later from the Measurement View by tap-holding and dragging the field to the "Edit" command area. While in the Edit Multi-choice screen just tap on the gray box labeled "Edit Items List" in order to make edits.

5.) Tally Field Types

Tally fields provide counts of records which adhere to rules you set. In order to use the tally field, you must define at least one rule. When you create a tally field, you'll be presented with a list of available fields from the current Study. Here's an example:



You create rules by specifying a field as an input to the rule, then specify a value or range of values the field must contain in order to be counted in the tally. In this example, the user is interested in counting the number of Female fish in the study, so they select SEX as the filter rule and set it equal to Female. This tells the tally field to look for those records of the study wherein SEX=Female and tally the total count of them across the Study. You can create additional rules, including Batch specifications and you can create multiple Tallies, just keeping in mind that Tallies require quite a bit of processing power, so if you have lots of Tallies, performance of the application may be impacted.

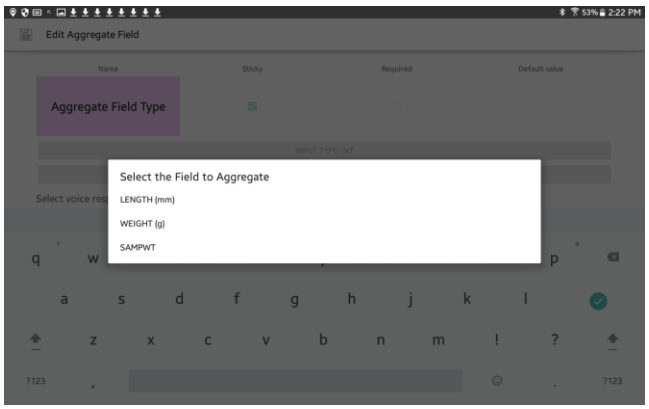
You can't tap and change a Tally field value during general use, as its value is derived from the rules established in the Tally field settings automatically during record-taking. Tally fields are shown in a light blue.

6.) Aggregate Field Types

An Aggregate field type is similar to a Tally field type, in that it operates on all records in the Study; but instead of counting a number of records which meet certain criteria, the Aggregate function performs mathematic functions on chosen fields across those records.

This is useful for finding things like Summations or Averages of fields across a Study.

In the following example, an Aggregate field will be used to provide real-time summation of weight.



After selecting the option for creating an aggregate field, the user is prompted to 'Select the Field to Aggregate.' The application displays quantitative valued fields that you might be interested in aggregating (i.e. decimal or integer input types). By default, WEIGHT (g) and LENGTH (mm) fields are displayed on this list. In this example, the user wants to get the sum of all of the weights in the study, so the WEIGHT (g) field is selected, then "Summation" for the operation type. The user is not required to define filters for the aggregate field types like in the tally field types but does have the option to. Aggregate fields are shown in purple.

7.) Yes/No Field Types

Yes/No field types are defined in the same way as multi-choice field types. The formatting is the same. Refer to Multi-Choice Field Types section for more information.

8.) Auto-Fill Field Types

Auto-Fill fields are a powerful field-type which allows the following functions:

- Create multiple fields quickly via a CSV file

- Changes to one or more field values based on changes to another field value

Perhaps the best way to describe Auto-Fill function is to use an example: In the case that you have a Species Code List, with 3 fields involved:

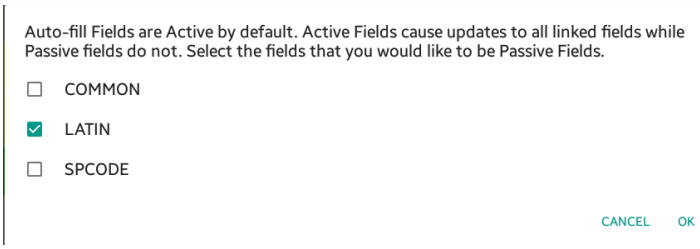
COMMON LATIN SPCODE

By importing a CSV file with those three names as column headers, and rows of data beneath them, you've quickly and easily created:

- 3 fields called: COMMON, LATIN, SPCODE
- Linking between those fields, such that a change to, for example, SPCODE changes the other two, and vice-versa.

There are two types of auto-fill fields that the user can create upon importing the CSV file which defines the auto-fill fields and linking. These are called Active Fields and Passive Fields.

Active fields will "drive" or change the other fields that are linked to it and Passive fields will *not* "drive" any fields upon receiving a value. For example, a user imports a Species CSV file. The columns in the CSV file are titled "COMMON, LATIN, and SPCODE."



In this example, the user will set the field LATIN to be passive by selecting it with the check box.

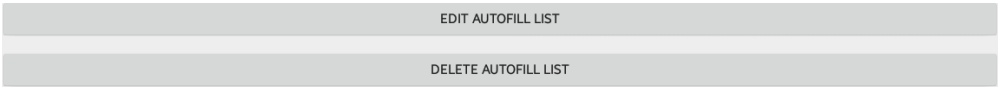
While taking data, if the user changes the value in the fieldbox for COMMON, the field will automatically update the LATIN and SPCODE fields with their respective values according to the records originally imported via the CSV file we discussed above.

Similarly, if the user changes the SPCODE values by selecting one of the values from the CSV file on the selection list, it will update LATIN and COMMON fields with their correct values according to the table established by the CSV file import.

However, if the user changes the LATIN field, because the user had selected "Passive" for the LATIN field during the AutoFill field creation, the fields COMMON and SPCODE will NOT change.

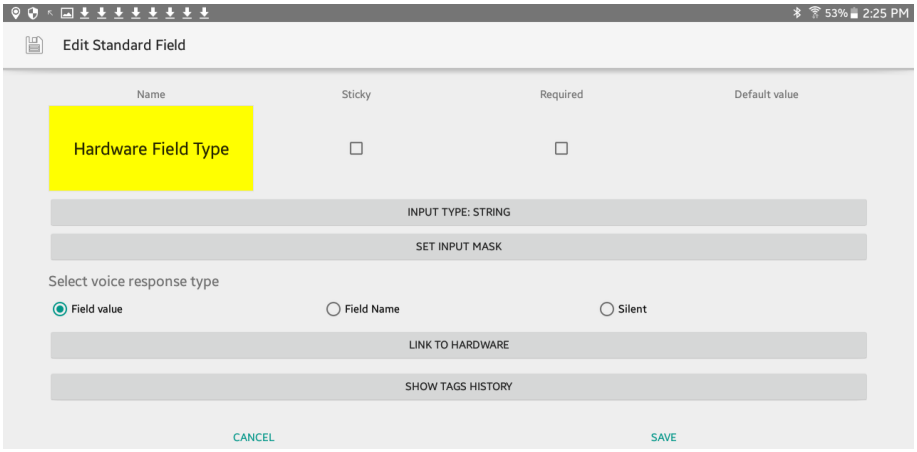
Auto-Fill fields can save a lot of time by getting rid of the need to manually enter redundant data in a study.

Edit the auto-fill by tap-holding and dragging one of the fields that was created from the CSV file to the 'Edit' command area at the top of the Measurement View or Study Settings page and then selecting one of the following grey buttons at the bottom of the edit variable page.



9.) Hardware Field Types

Hardware field types allow you to link fields with peripheral devices (or "hardware"). You can link a single peripheral to multiple fields so you can take, for example, multiple length values (Fork, Total, etc. Hardware types are added from time to time; at the time of this writing, Fish Measurement Boards, Calipers, PIT tag readers, Scales and Label Printers are supported.



After selecting to create a hardware field type, name the field, then create the link to your peripheral by tapping on the "Link to Hardware" button shown in the middle of the page.

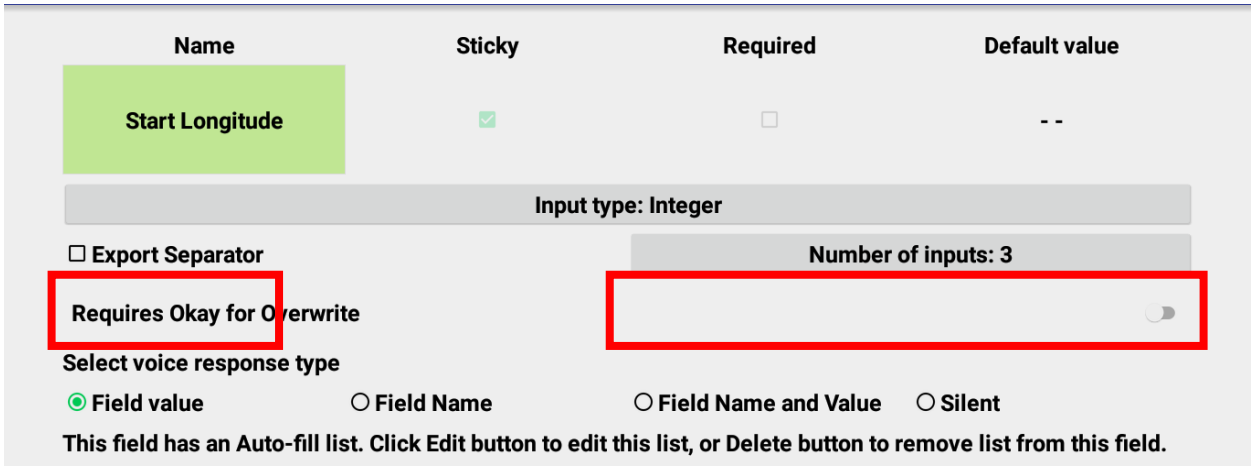
While in Measurement View, if there are multiple fields linked to the same piece of hardware, the fields will be filled out one-by-one from left-to-right and top-to-bottom.

10.) Multi-Segment Field Types

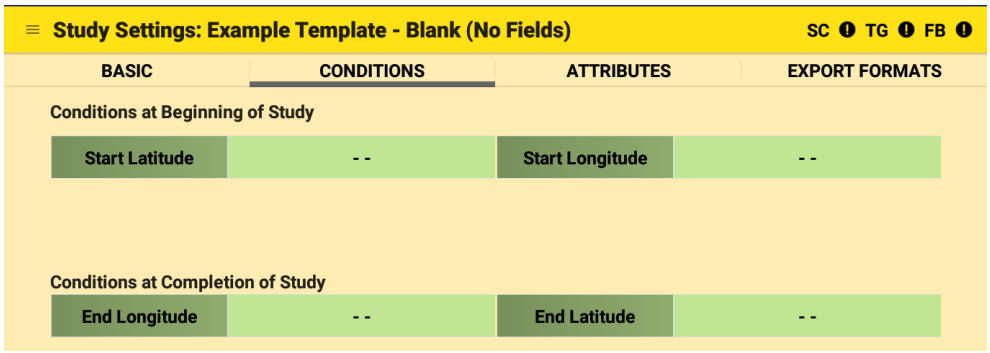
Multi-Segment Fields allow multiple value segments to be split up within a single field type. These fields can contain up to 5 different data segments and can also be linked to an Auto-fill list. A common use for these field types are for latitudes and longitude field types. The following example will go through the steps necessary in order to create longitude and latitude multi-segment fields that are also linked to an auto-fill list.

Multi-Segment Auto-Fill Example with Latitudes and Longitudes

In this example, the user will have 4 multi-segment fields. There will be a Start Latitude, a Start Longitude, an End Latitude, and an End Longitude. First of all, the user will create a multi-segment field for each of these values.



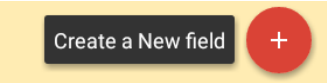
Latitude and Longitudes are generally broken up into three different values: Degrees, Minutes, and Seconds. In the future, the DCSLinkStream application will support multiple longitudinal and latitudinal formats. For each of these fields, the user selects the number of inputs to be 3. This is shown in the picture above. The user also has the option to check an 'Export Separator' checkbox for these fields. If this box is checked, then the multi-segment values will export **with** a dash '-' in between them. If the 'Export Separator' box is **not** checked, then the multi-segment values will be exported together with no dashes '-' between the values. In this example, these 4 different fields are going to be put in the Study Settings on the Conditions page so that the values will not change over the course of the entire study.



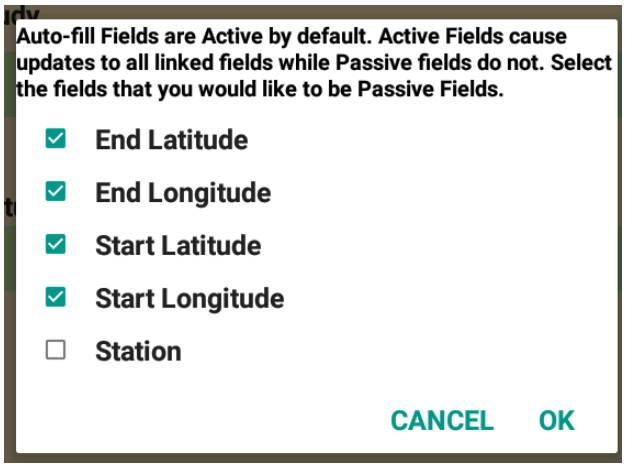
If you want to type in these values manually, you're all set. However, in this example we want to load an Auto-fill list that connects station numbers to respective longitude and latitude values. We want the 'Degrees' and 'Minutes' values to auto-fill according to station number, leaving the 'Seconds' value blank for manual entry. First we create a CSV file so that the column headers match the name of their multi-segment fields that we just created. In the CSV file, we used dashes "-" to separate the different segments in the 'Multi-Segment' field types.

	A	B	C	D	E	F
1	Station	Start Latit	Start Long	End Latitu	End Longitude	
2	1	35-42-	73-47-	35-42-	73-47-	
3	2	35-42-	73-46-	35-42-	73-46-	
4	3	35-42-	73-45-	35-42-	73-45-	
5	4	35-42-	73-44-	35-42-	73-44-	
6	5	35-42-	73-43-	35-42-	73-43-	
7	6	35-42-	73-42-	35-42-	73-42-	
8	7	29-46-	73-47-	29-46-	73-47-	
9	8	29-46-	73-46-	29-46-	73-46-	
10	9	29-46-	73-45-	29-46-	73-45-	

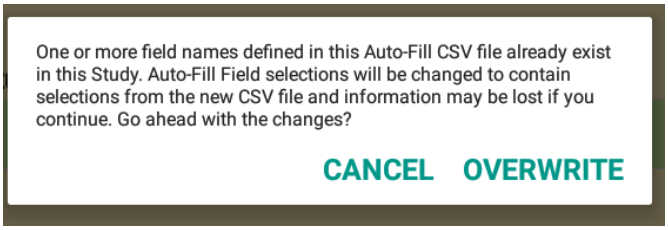
We've filled in the latitudes and longitudes with 'Degrees' and 'Minutes' along with a trailing dash '-' to signal that there is a blank value for the 'Seconds' value. Now we tap on Create a New Field, select 'Auto-Fill' type and then select the CSV file we created.



Before the auto-fill list will import, we'll need to tell DCSLinkStream which fields are passive and which are active. A quick recap on active vs passive auto-fill fields: passive auto-fill fields will not change the values of other fields in the auto-fill lists. Only active auto-fill fields will change the other auto-fill fields connected to it. In this example, the user wants to select their 'Station' from the list and have it populate all of the latitudes and longitudes. However, we don't want changes to the longitude or latitude fields to change our Station number. So, we set the latitudes and longitudes to passive and set the 'Station' field to active, as shown below:

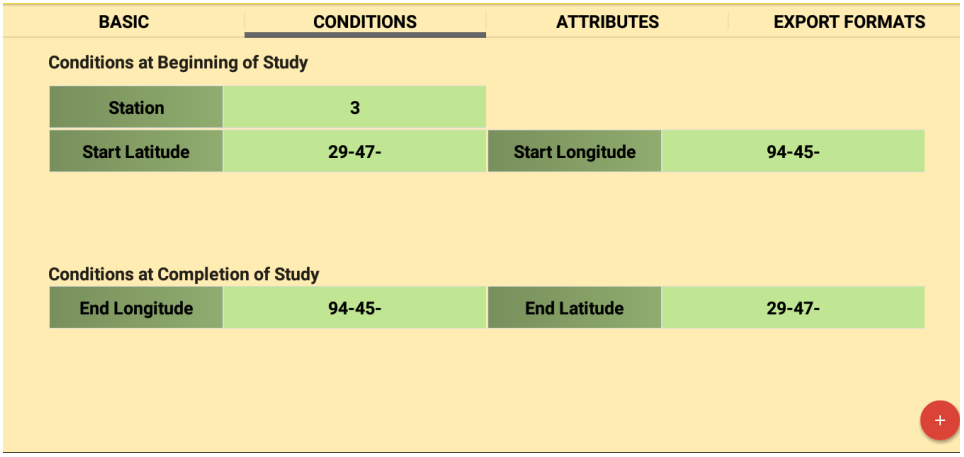


Tap "OK" and you may or may not see the following dialog:

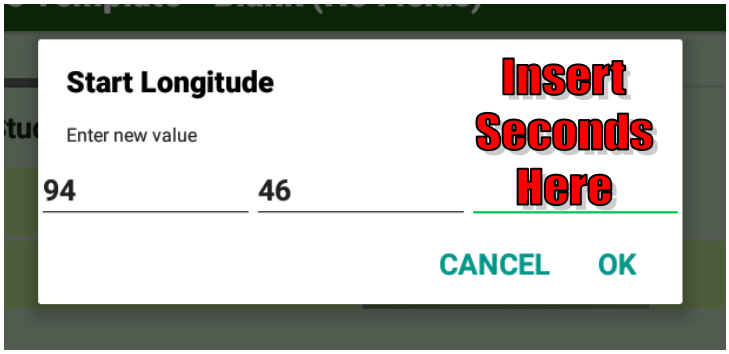


If DCSLinkStream sees that you already have fields named the same as in your CSV file, it'll warn you with the dialogue above. We had created the Latitude and Longitude fields already, so we get this warning. We tap "OVERWRITE" and the auto-fill field creation process overwrites any existing fields (Note: Creating an autofill which overwrites existing fields will result in data loss if records contain values for the overwritten fields). After receiving the 'Auto-Fill import Complete' message, we may need to unhide the STATION field by tapping on the red "+" button in the bottom right hand corner and then tapping on the 'Show Hidden Fields" selection. Now, whenever the value for STATION is changed, it will change the longitude and latitude to the values coinciding with the STATION location taken from the CSV file.

Note: *Auto-fill Multi-Segment fields will always be passive even if they're set to active.*



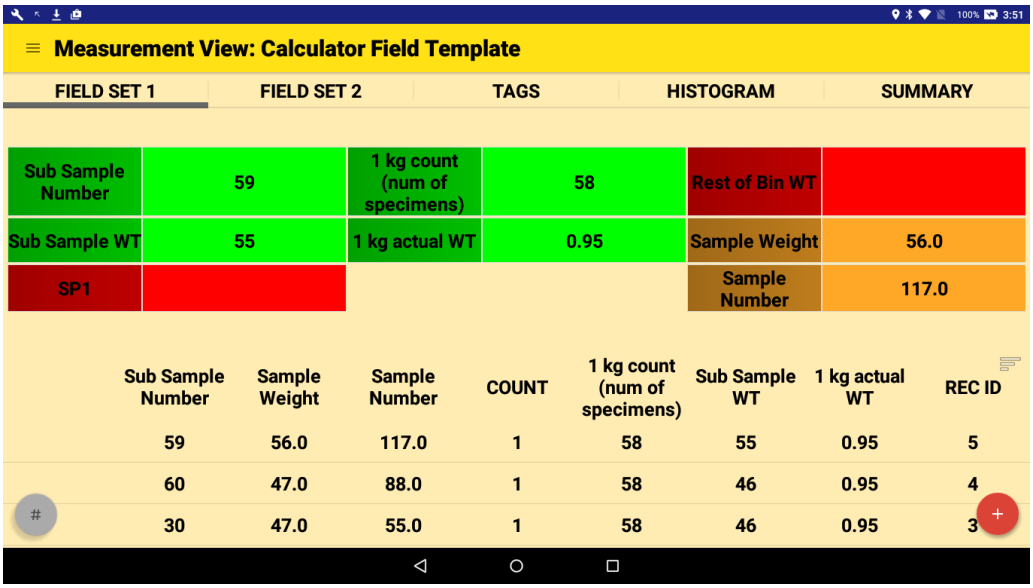
From the measurement view (or batch page or study settings page), the data entry dialogue for the Lat and Long fields we created look like this:



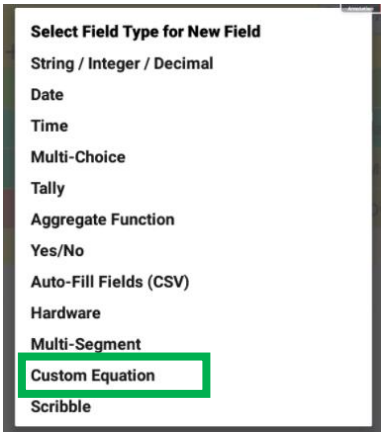
Since we did NOT select the 'Export Separator' check box in the multi-segment fields settings page, the multi-segment fields will export without the hyphen separator. In the 'Start Longitude" above, the values would export as 9446## in the Study Settings file (CSV) where' ##' corresponds to the 'Seconds' values. If the 'Export Separator' checkbox is selected/on, the 'Start Longitude' above will export as 94-46-##

11.) Custom Equation Field Types

Custom Equation field types allow users to perform custom calculations on multiple fields within a record. While Tallies and Aggregate fields perform operations on one field across many (or all) records, the Custom Equation fields perform calculations on many fields within the same record. Aggregate fields can do operations on Custom Equation fields and vice versa. Thus, by combining Aggregate and Custom Equation fields, complex feedback can be achieved in real-time. Custom Equation fields are colored orange.

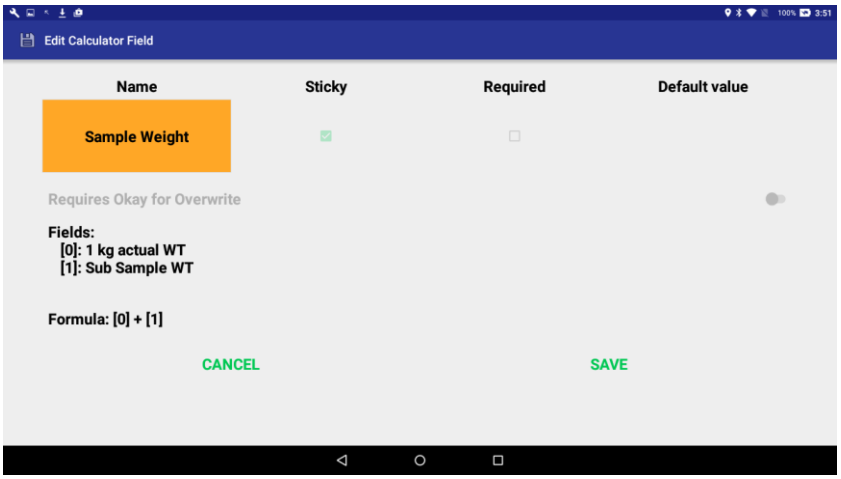


To set up a Custom Equation field, first taps the red "+" button, tap on the selection for 'Create a New Field' and then finally on the "Custom Equation" selection.

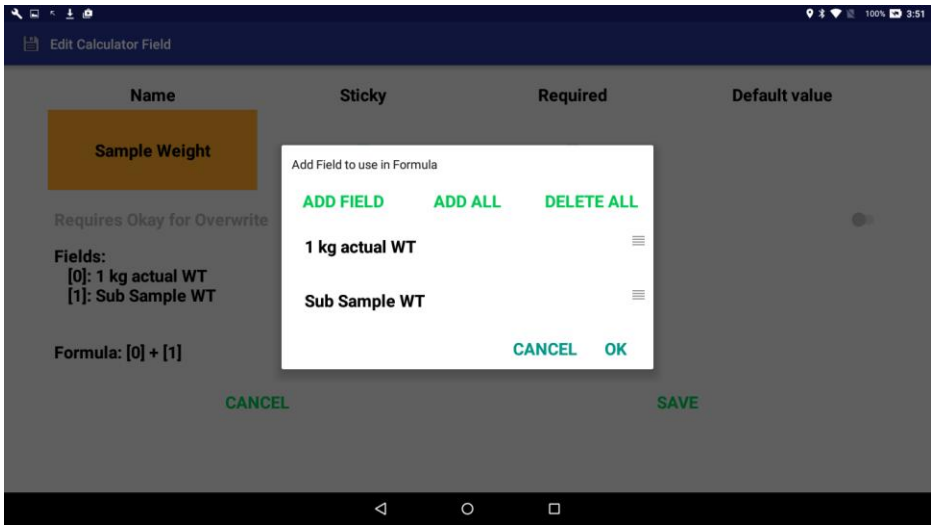


In this example, we're going to create a simple Equation field named 'Sample Weight.' This value is calculated by adding together the '1 kg actual WT' and 'Sub Sample WT' field values from the study. This equation is shown below.

$$Sample\ Weight = 1\ kg\ actual\ WT + Sub\ Sample\ WT$$

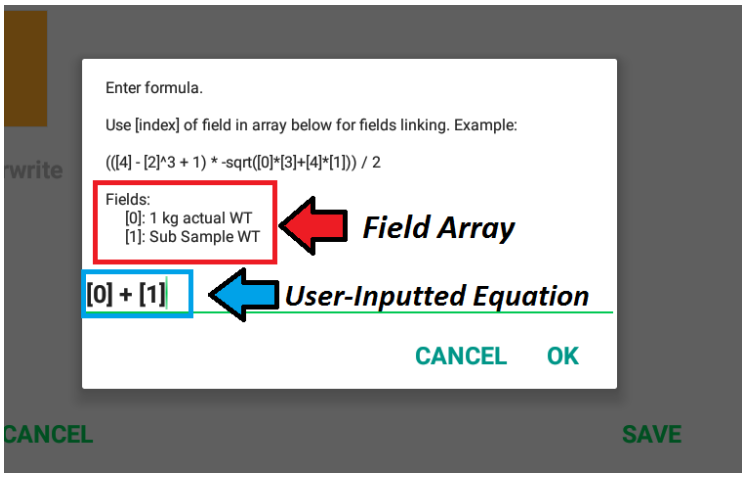


Before writing our equation, we need to first tap on the 'Fields:' section so we can select the fields we'll be using:



Above, we've already tapped 'Add Field', then added "1kg actual WT", tapped 'Add Field' again and added "Sub Sample WT" field. Tap OK.

Now, we'll create our formula. Tap on the word 'Formula'.



Here, the user can see their field array displayed. In this example, "[0]" corresponds to 1 kg actual WT and "[1]" corresponds to Sub Sample WT. The short-hand bracket nomenclature is also reflected in the Field List, above the Equation line, for reference.

There are a couple of things to keep in mind when doing Custom Equations:

1) You must include the brackets with the numbers.
2) You must use all fields that you've referenced in the field list. If you end up not using a field, delete it from the field list.

Now tap 'OK' to save your custom equation field. Now whenever the values for '1 kg actual WT' and 'Sub Sample WT' are filled, 'Sample WT' will automatically calculate according to your formula.

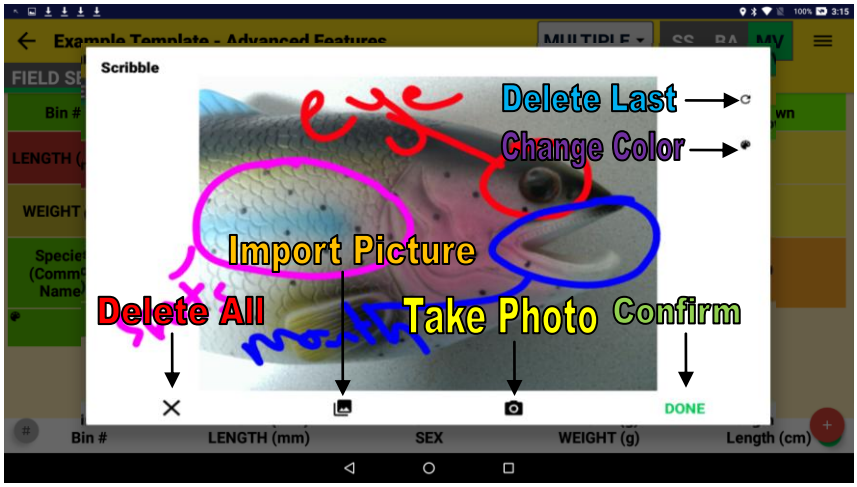
Multiple levels of calculations can be done using these Equation fields. For example, you could create another Custom Equation field type named 'Collection Weight' that uses 'Sample WT' as a formula input along with another weight value to calculate the weight of the entire collection. Complex calculations can be performed on the record data in real-time which can reduce the amount of data manipulation that may be required for the user after exporting. Custom Equation, Aggregate and Tally fields are recorded along with all your other fields.

If you edit a record, the Custom Equation, Aggregate and Tally fields will re-calculate based on the new information, from the record you edited to the last record in the database.

12.) Scribble Field Types

Scribble field types are useful for taking a picture or writing a quick note to be associated with a particular record . The interface of a scribble field is shown below. Use the camera on your tablet to snap a photo (soon, use a remote camera to snap that photo), then jot a note. Or jot a note w/ the touch-screen without a photo.

An example of a useful scribble field is shown below. A photo was taken of the current specimen that is being reviewed. You're able to draw on top of the photo in order to identify regions and characteristics of interest.

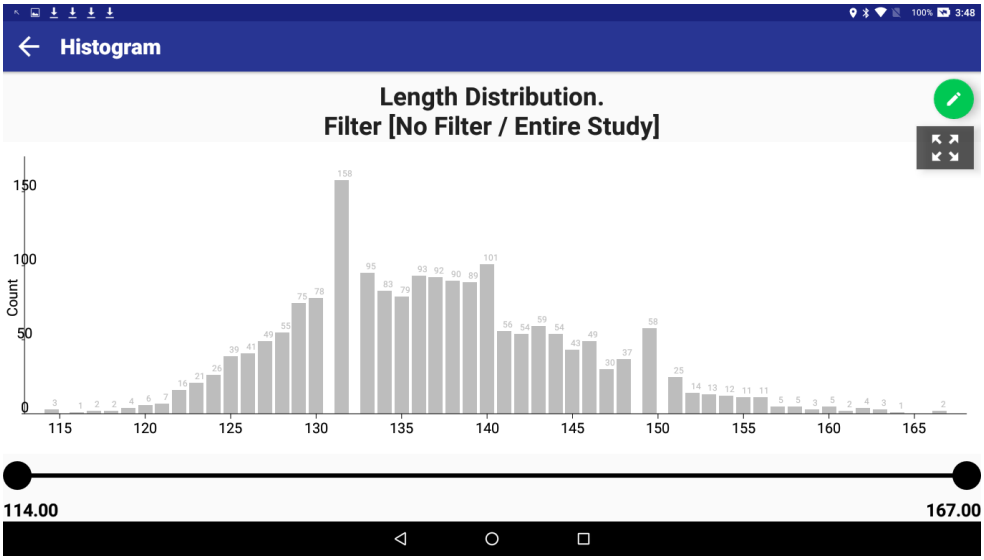


Field Colors in the Measurement View

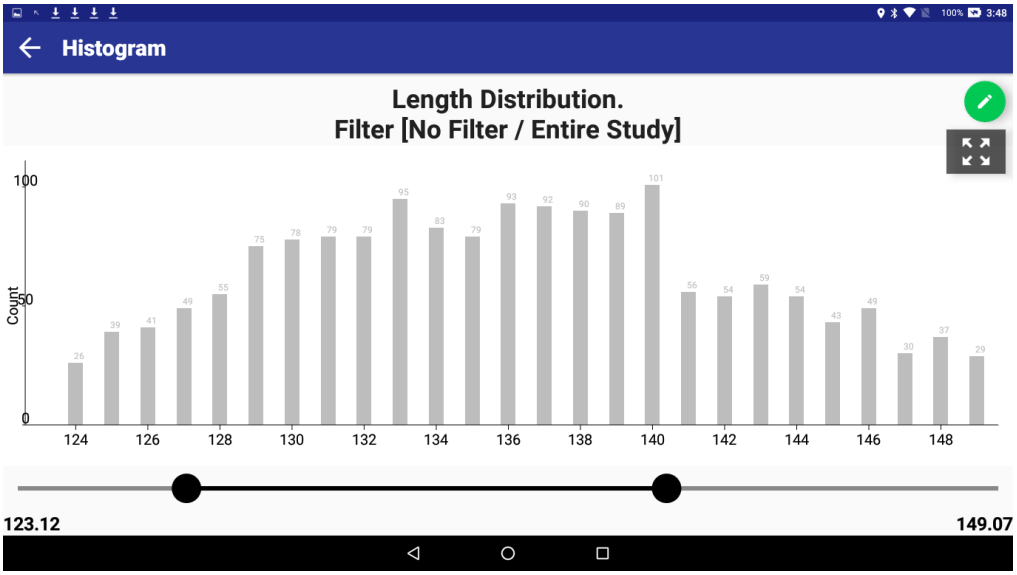
You can change which fields are required, sticky and their default values in the Study Settings Attributes area (described above). The color codes you'll see in the Measurement View are:

- Light Green (grayish) – Fields that are sticky, but not required.
- Yellow – Fields that are neither sticky, nor required.
- Red – Fields which are required.
- Blue – Tally fields telling you counted data about your study.
- Purple – Aggregate fields relaying the summation of quantitative data about your study
- Orange – Calculator fields that perform real-time custom user-inputted calculations on the record data

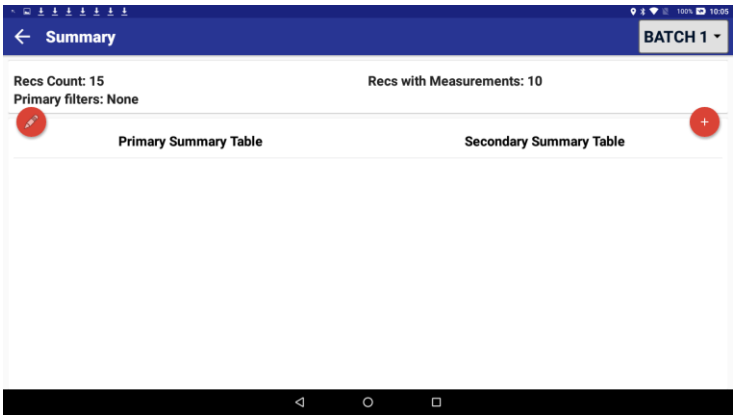
Histogram



The histogram tab provides a visual representation of the distributions of user-selected values such as weight or length. To change the field being plotted, tap the green button in the top right corner and then tap the numeric field you are interested in to plot in the histogram. The histogram will auto-scale to the information provided. However, you can also change the range of values by dragging the endpoints of the range selector. This same data is shown in the picture below but the range has been changed from 114.00-167.00 to 123.12-149.07.



Summary Page



The Summary Table is an excellent way to get an overview of your study, in tabular form. The summary table offers a two-level approach to the tables; a "primary" level and a "secondary" level. More on that in a bit.

In the Summary Table, you have the option to:

- Select Table from Existing or Create New Table
- Assign a Primary Field
- Assign a Secondary Field
- Assign Primary Filters
- Modify Columns
- Modify Rows
- Save the Table

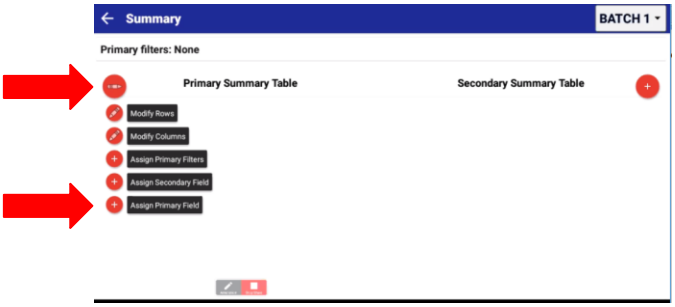
<u>Select Table from Existing or Create New Table</u>

When you first navigate to the Summary page after making records in your study, you will be presented with a page that looks like the picture below.

The batch selector in the top right corner of the page allows you to select which batches contribute to the summary view.

Let's tap the red circle w/ the plus-sign to reveal the various table operations.

Now tap "Create a New Table" and name it "Table 1", then click the red-circle-with-X to hide the table action menu. Now, select the red circle button w/ the pencil on the left.



Assign a Primary Field

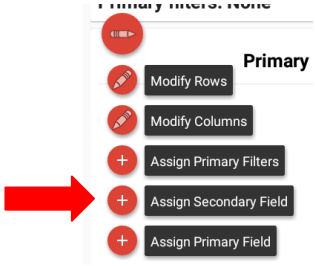
This is where you pick the first field, or Primary field, by which you'll organize your Summary Table. After selecting this option, you'll see a list of fields from your study. In this example, we'll select 'Species'.

Now we see that the table shows two sections, each with a header corresponding to the name of a Species which is present in the Study. In this sample, 2 species exist in the records database. If the records in your Study had 10 species, you'll see 10 sections, each with their own section header with the name of the Species, in alphabetical order. Under each section's header (Species name, in this case), a tally of the total records that were measured

and counted for that Species is shown. This is the simplest of summary tables, using just a Primary grouping field (in this case, "Species") and just showing "Counted" and "Measured" tally values. Note that if a species doesn't appear in any records, they won't show up in the summary table. So, your Species field can have hundreds of entries without them showing in the summary tables. Only entries which occur in records will appear.

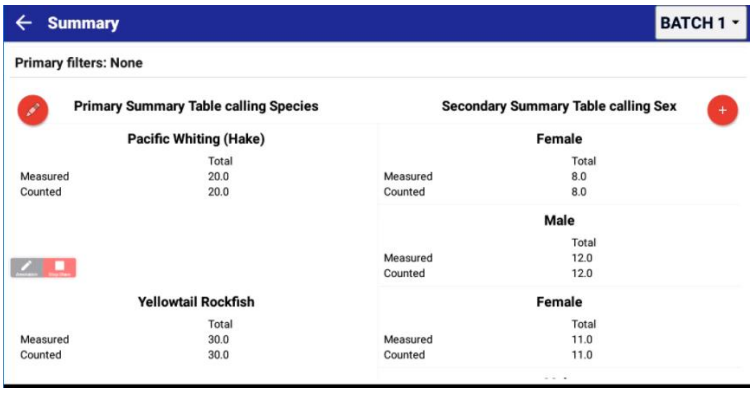
(Remember: "Measured" records are records with a length or weight measurement associated w/ the record. "Counted" records are records which have a Quantity associated but may not have a length or weight measurement associated. All records contribute at minimum Quantity 1 to the Study Count. All records have a Count, but not necessarily a Measurement.)

Assign a Secondary Field



Assigning a Secondary Field to a Summary Table will split the summary screen in half and create sub-groups of the Primary groupings on the right half of the screen. So now, for each of the Species headers we created with the Primary field selection, we'll have any number of sub-groups which are listed to the right, for each of the Primary header groups on the left. Let's select "Sex" as the secondary field for our example.

After assigning the secondary 'Sex' field, the summary table now looks like the following:



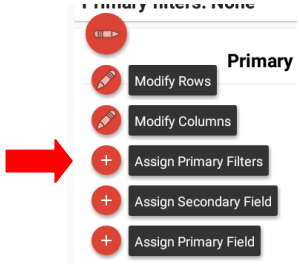
The table is now broken up into groups of the different "Sex" field values, on the right, within each Species group, on the left. If we had chosen a secondary field such as "Stations" with many entries in the Study database (say,

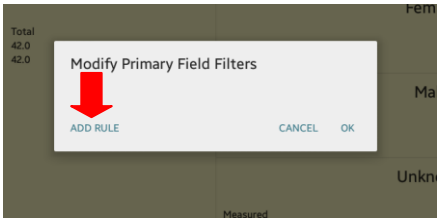
twenty), there would be 20 groups on the right for each primary section on the left. The Stations on the right would repeat for each primary group on the left.

Assign Primary Filters

In addition to assigning primary and secondary fields, a primary filter can be applied to the entire table which will add another level of customization to the summary page. This can be used to refine the picture shown in the summary table. In our example above, with Species as our Primary and Sex as our Secondary, if you were to apply a Station=3 filter, only those records which have their Station field equal to 3 will be reflected in the Summary Table.

In order to do this, select the 'Assign Primary Filters' option from the *Expand Option List* as shown in the picture below.

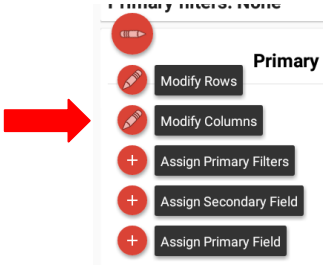




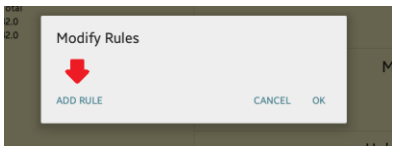
Tap on the "Add Rule" function marked by the red arrow in the picture above. A list of fields within the study will appear on screen.

Modify Columns

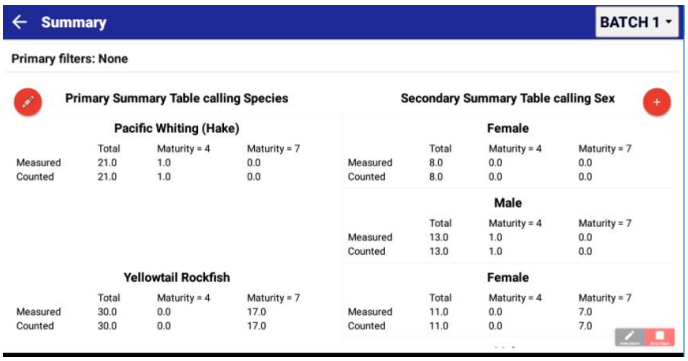
It is also possible to apply the concept of filtering in a different way. If you want to see how your data is broken up using a field values as grouping criteria, you can use Columns in your table. Do this via the 'Modify Columns' option on the *Expand Option List* shown in the picture below.



Tap on "Add Rule" option as shown in the picture below.

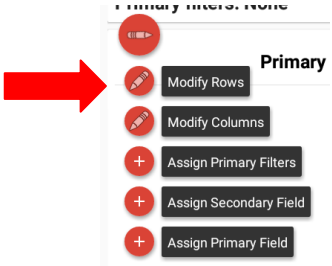


In this example, the columns Maturity=4 and Maturity=7 are added to the table. This looks like the following:

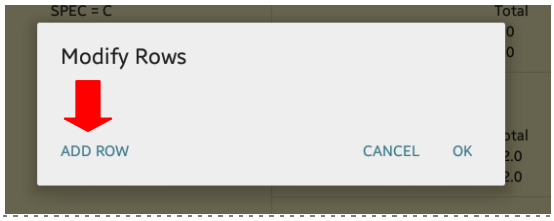


Here, you'll see that lots of Yellowtail Rockfish have a Maturity=7, and zero of the Hake. You could add more maturity levels with more columns to see further breakdown of maturity levels per species and sex.

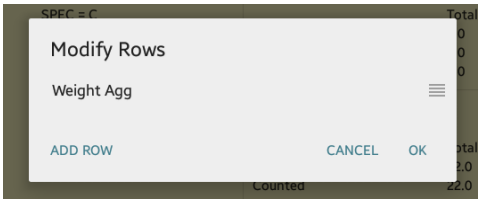
Modify Rows



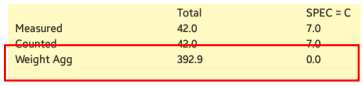
Rows can also be added into the tables to add another level of customization. The rows are different than the columns because they do not need to abide by a single rule like the primary filter and columns. Rows illustrate 2 different types of values. Rows will either tally the data together or aggregate it. The tallies behave the same as the "Measured" and "Counted" rows do by default. After selecting the option to "Modify Rows" on the *Expand Option List* shown in the picture above, the application will flash the dialog box shown below.



Tap on the "Add Row" button. A dialog with all of the field names in the study will be displayed. For this example, an aggregate field that illustrates the combined weight of all of the samples will be selected. This field is named "Weight Agg."



Now that this field has been added as a row, tap "OK" and observe the updated summary table.

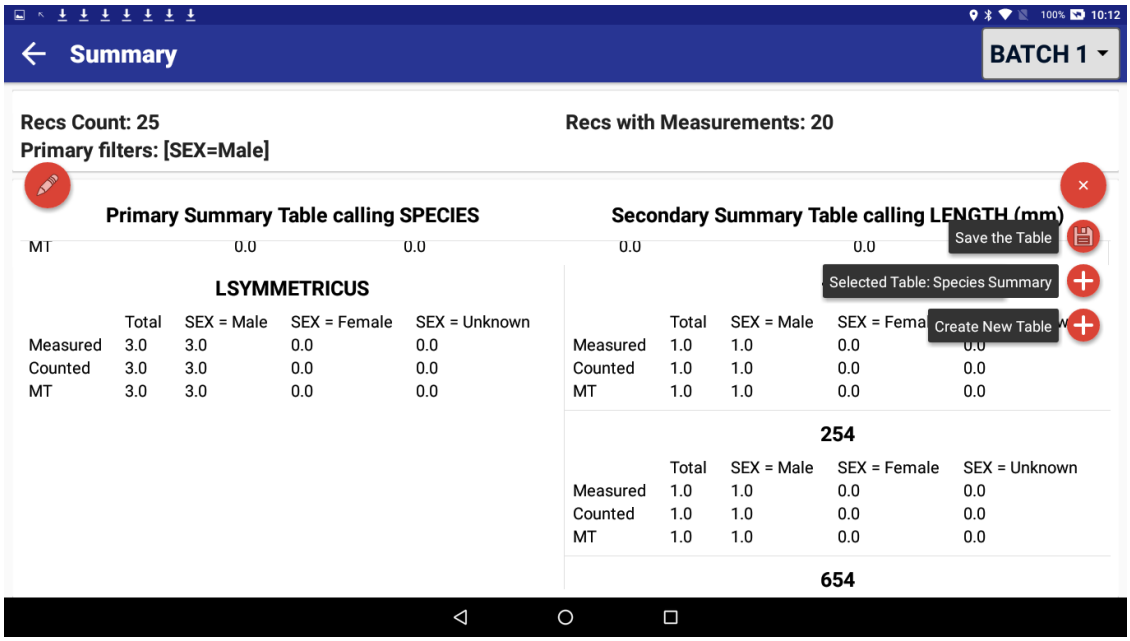


	Total	SPEC = C
Measured	42.0	7.0
Counted	42.0	7.0
Weight Agg	392.9	0.0

This row now shows the aggregated Weight values per each field and filter that has already been applied to the table. The weight that has been measured is equal to 392.9 units for a certain Species. More rows can be added such as tally fields. Any other field type other than an aggregate field will be displayed as tallies. For more information on the types of fields, see the *Types of Fields Explained* section of this document.

Save the Table

The table will automatically save when you navigate away from the summary page. However, the picture below shows how to manually save the summary table by tapping on the red expand button on the right side of the page.

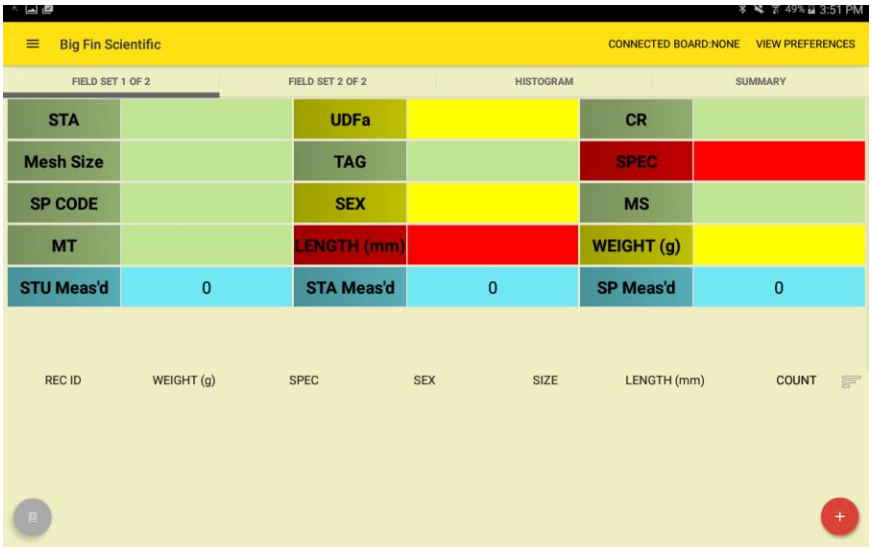


Text will flash at the bottom of the screen indicating that the table has been saved.

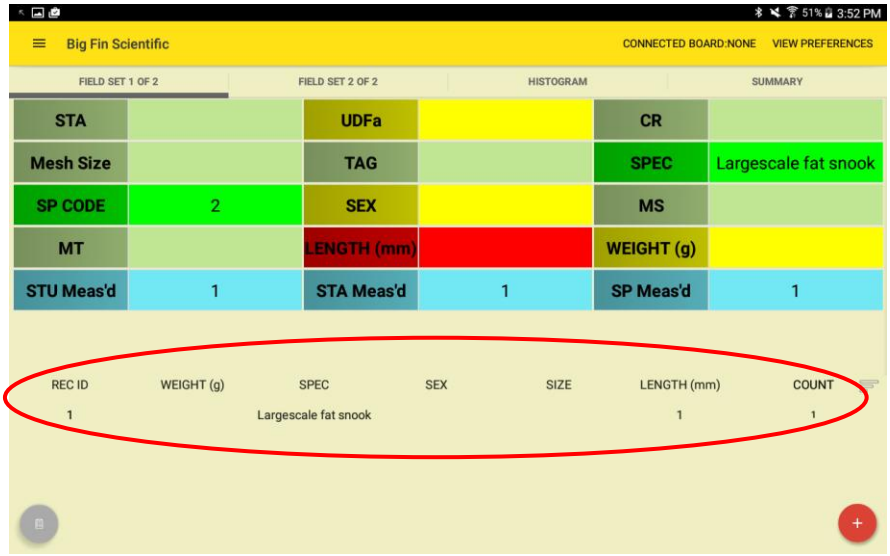
How Fish-Records are Accepted into the Database

Records are created when all the required fields (shown in red in the Measurement View) are filled with data (turning them to green.) Remember that you may have required fields in field-set 2 or on the hidden field list. So, if you're wondering why the application is not creating a record, check for red fields there.

You can fill the required fields in any order you wish, but all red fields must turn to green before the application will accept the record into the database.



In the screen shot above, both species and length are required fields. All required fields must be filled before a record will be accepted.



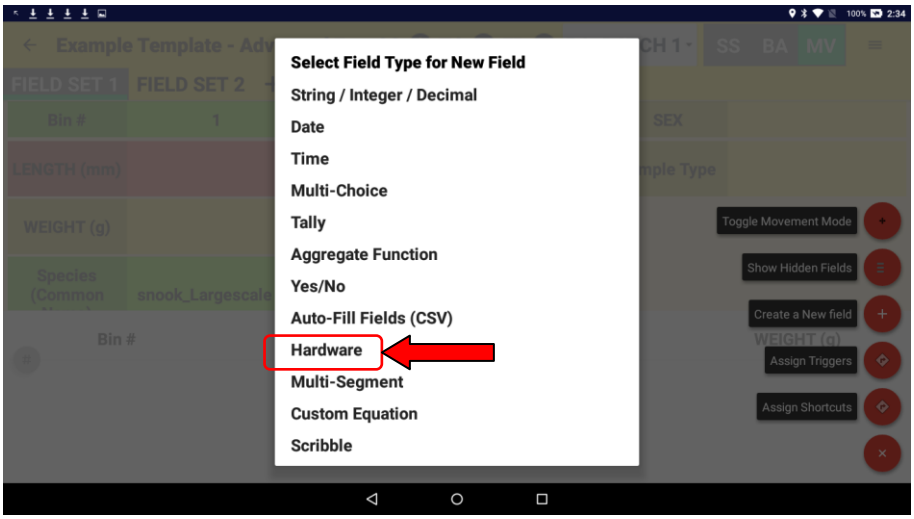
After entering a species, and then entering a length and tapping OK, the application will accept the record.

Special RFID (PIT) Tag Features

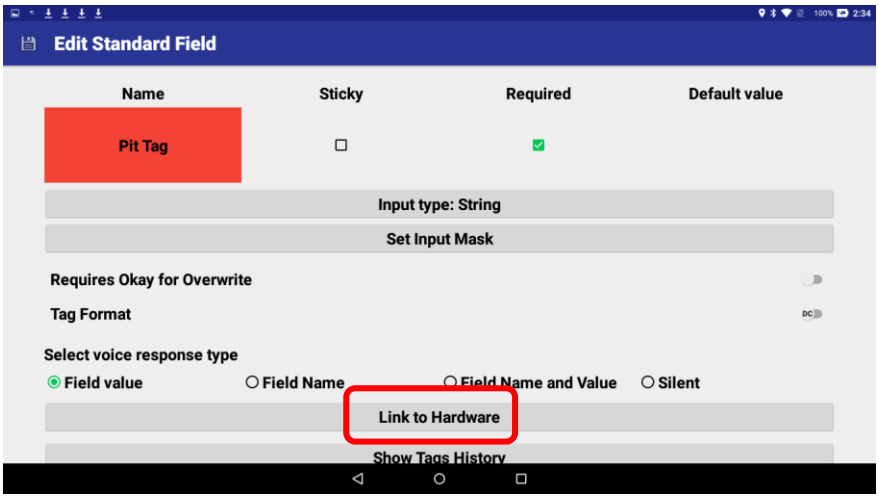
Synchronization is important in interpreting large data sets. Special features for PIT tag users have been added to the DCSLinkStream application to help merge PIT tag data across different data sets. You can import past tag records into studies, create tagging alerts and drill into a full history of a tag, all during your tagging or sampling session.

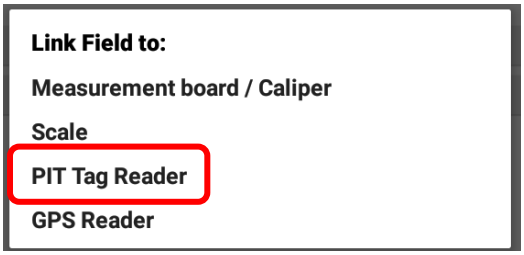
Recording Pit Tags

In order to record Pit Tag values into the DCSLinkStream application, first create a Hardware field type and then link it to the Pit Tag Reader. This can be done by pressing the red "+" button in the bottom right hand corner of Measurement View, tapping create a new field, and then selecting 'Hardware' as the field type.



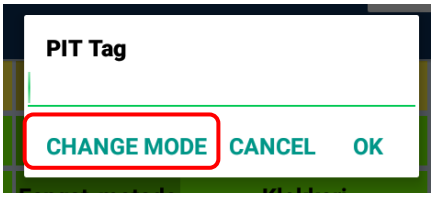
Name the field and then link the field to your 'Pit Tag Reader' by tapping the grey 'Link to Hardware' button and then select Pit Tag Reader



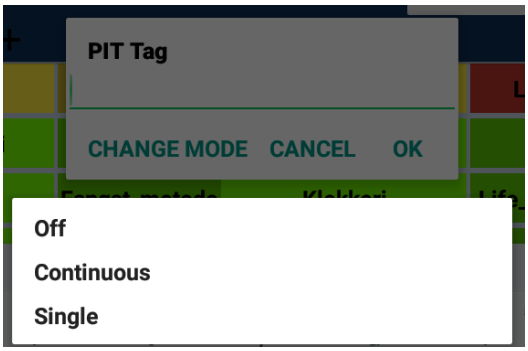


After linking this field to your PIT Tag reader, save the field and return to Measurement View. In this example, we've set the Pit Tag field to 'required' so that the value needs to be filled in order to make a record. If you are using a Peripheral Tag reader such as the Biomark HPR, please refer to the ***Adding Peripherals Guide*** located on the Big Fin Scientific website. Link: http://www.bigfinscientific.com/wp-content/uploads/2015/04/DFS-Adding-Peripherals-v-1-0.pdf

If you're using a DCSLinkStream board with built-in PIT reader board, when you tap on a PIT tag hardware field, a dialogue will open which has some PIT-tag related options the options for 'Change Mode, Cancel, and OK.'



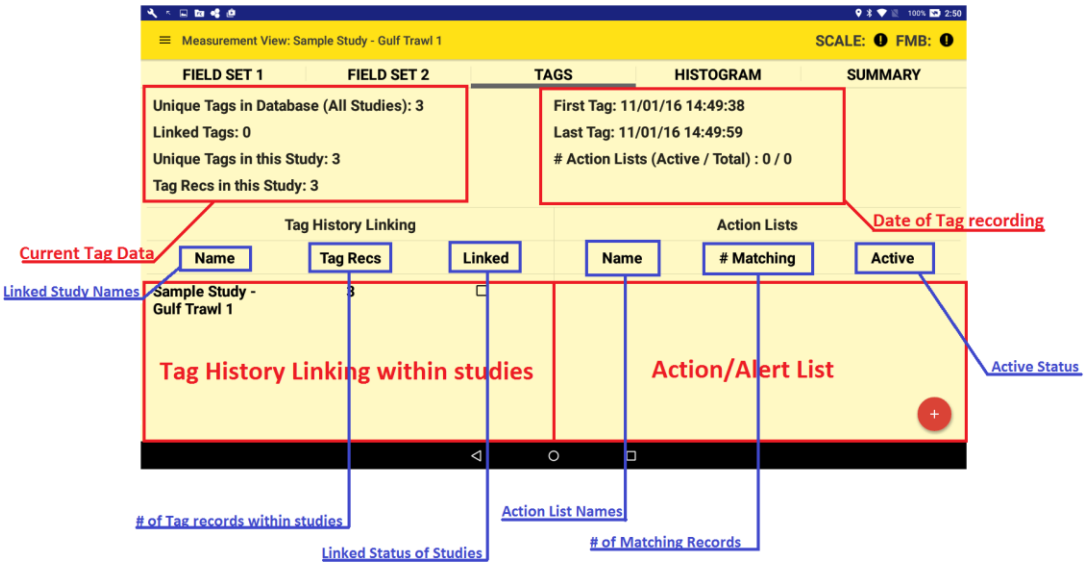
The latest firmware versions, by default, turn on the continuous read mode for the fish-boards. In order to save battery, tap on 'Change Mode' and then select the 'Single' for a single read to be made and then reader will shut off, or select 'Off' to turn the internal Tag reader completely off.



'Off' mode will turn the internal Pit Tag reader off completely. "Continuous" mode will turn the internal Pit Tag reader on and it will remain on so that multiple Tags can be scanned in a row. Keep in mind that "Continuous" consumes the most power. "Single" mode will turn the internal Pit Tag reader on for 9 seconds, after which it will turn off to save battery.

TAGS Page Explained

Once in Measurement view, there is a separate tab for TAGS at the top of the screen.



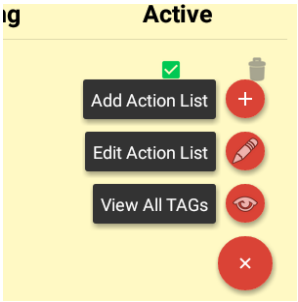
The top left portion of the page displays current tag information such as the amount of unique tags within the entire database, the number of linked tags, the number of unique tags within the current study, and the amount of Tags that have been recorded in the current study. The top right portion of the page represents the dates that the first and last tag were recorded. This area also shows the number of action lists that are located in the database.

The bottom half of the TAGS page is separated into two tables. The tables represent important Tag information and the associated alerts associated with matching tags. The left table illustrates the Tag History linking with a list of the unique studies within it. The first column of this table is the unique study names. The second column of the Tag history table "Tag Recs" tells you how many PIT tag values have been recorded within the study located on the same row. The third column of the Tag history table named "Linked" allows you to "link in" or "append" the tag history in the corresponding study with your current study. In the picture above, there is only one study in the 'Tag History Linking' table. Every study within the database that contains PIT tag values will be displayed on this list. This allows you to merge all of the tag values in the different studies together so that your tag alerts and tag history views can operate on your entire tag database, not just your current study.

The right table at the bottom of the TAGS page represents the different 'Action Lists' that you have. Action Lists are created to alert users when a PIT Tag value of interest is encountered. The first column represents the name assigned to the action list. The second column "# Matching" represents the number of matching tags that have been found on the action list within the linked studies in the database. The third column named "Active" is a toggle switch similar to the "Linked" toggle in the 'Tag History Linking' table on the left. This "Active" column allows you to turn the action list on or off.

Using the Action List

To use Action lists, create a list of actions and PIT tag numbers in a CSV file, with no header row, PIT tag number as the first column and your alert message in the 2nd column. Then press the red action button.

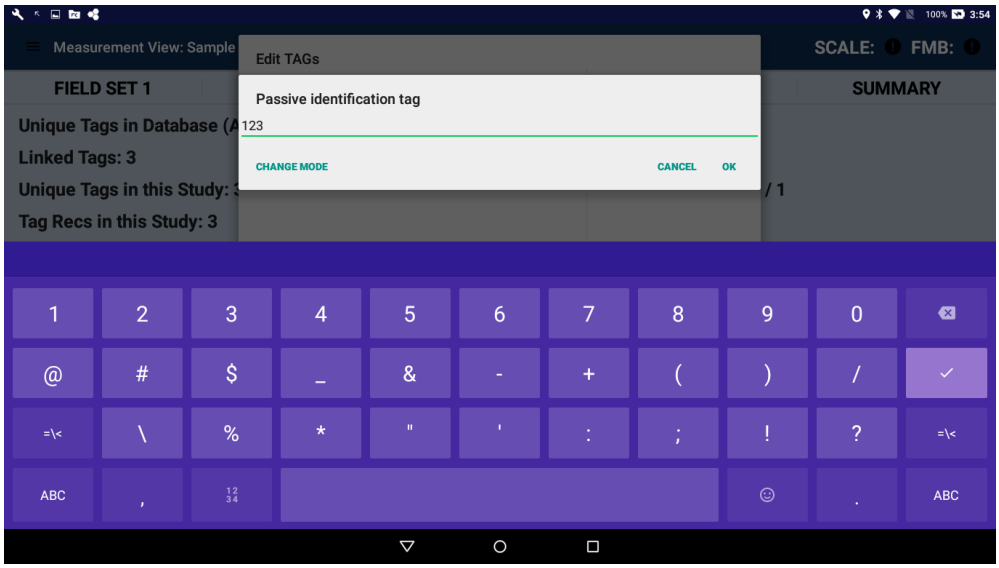


If an Action List has not been created yet, tap on "Add Action List" option, name your list and you'll see the "Edit TAGS" box shown below.

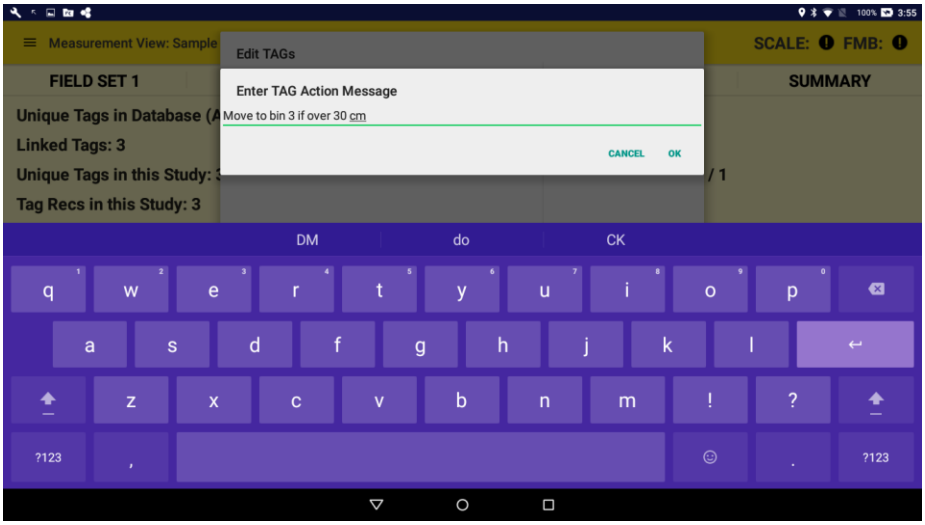
Here, you can enter alerts by hand or import the CSV file you created.

Adding Individual PIT Tags

In order to add an individual tag, tap on "ADD A TAG" button. You'll see this:



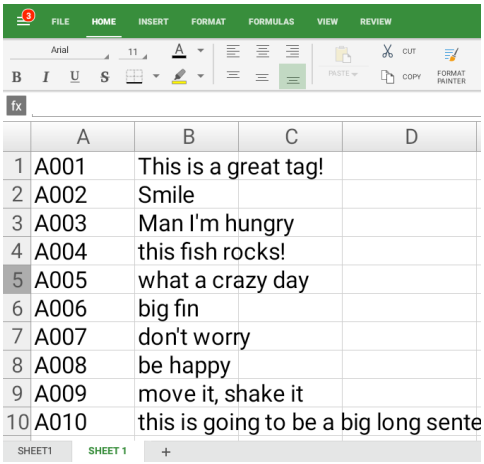
Type the exact value of the tag (all uppercase) and tap "OK." Next, you'll see: 'Enter TAG Action Message.' This is the alert message that will be displayed when the TAG you just entered is encountered.



Importing an Action-List of PIT Tags from CSV File

The application also allows you to import a TAG list with the actions associated with them from a CSV file. Select the "Import Tags from CSV File" option in the "Edit TAGS" box.

The CSV file format is shown for reference, below:

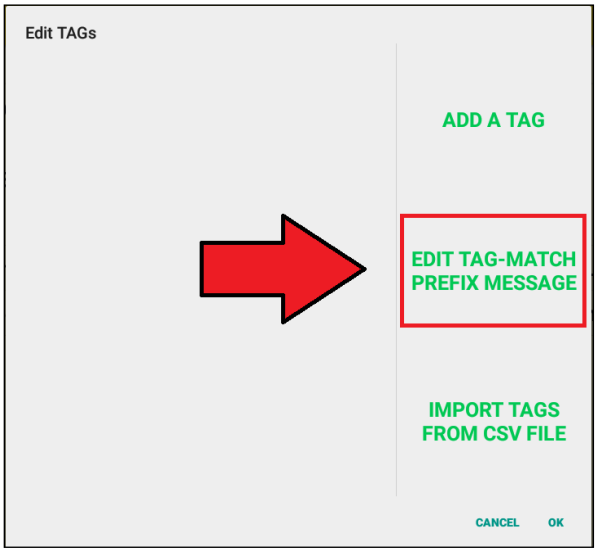


	A	B	C	D
1	A001	This is a great tag!		
2	A002	Smile		
3	A003	Man I'm hungry		
4	A004	this fish rocks!		
5	A005	what a crazy day		
6	A006	big fin		
7	A007	don't worry		
8	A008	be happy		
9	A009	move it, shake it		
10	A010	this is going to be a big long sente		

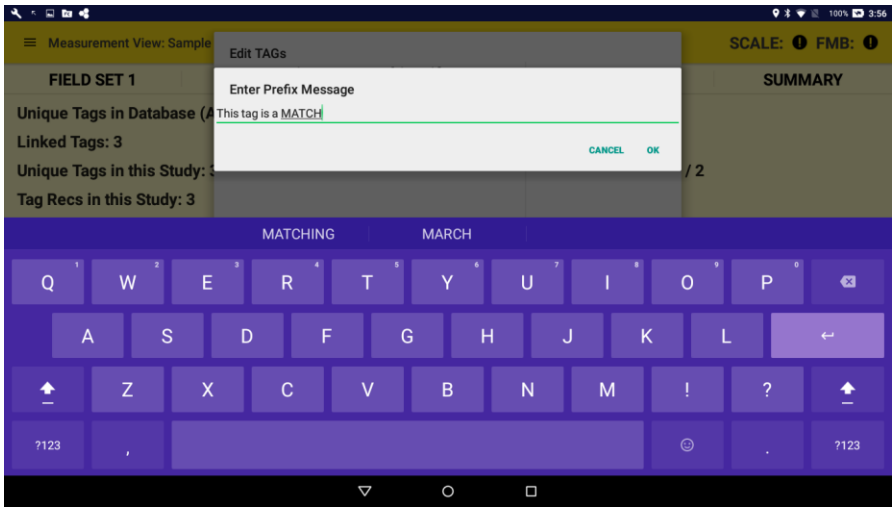
Find this file after tapping the 'Import Tags from CSV file' and then tap 'OK.' All of the TAG values with their respective actions will now be displayed in the 'Edit TAGS' page. Individual tag values and actions can be edited or deleted by Tap-holding on one of the selections while in the "Edit TAGS" page.

Edit Tag-Match Prefix Message

When a matching tag is encountered during a study, the corresponding alert message is displayed. In addition to the alert, a pre-amble or prefix message is displayed. To set up the prefix message, tap on the "Edit Tag-Match Prefix Message" option in the "Edit TAGS" box.



This will bring up the following dialog:

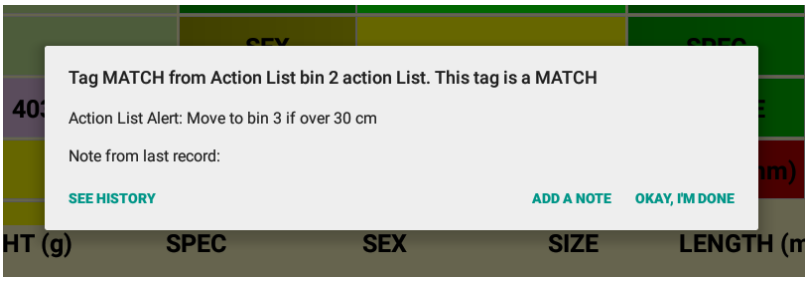


Using Action Lists

Once an action list has been created, edit by tapping on the red "+" button in the bottom right corner while in the TAGS page. New action lists can also be created here. Action lists can be activated by tapping on the "Active Status" box that corresponds to the desired action list. Multiple action lists can be activated for a single study.

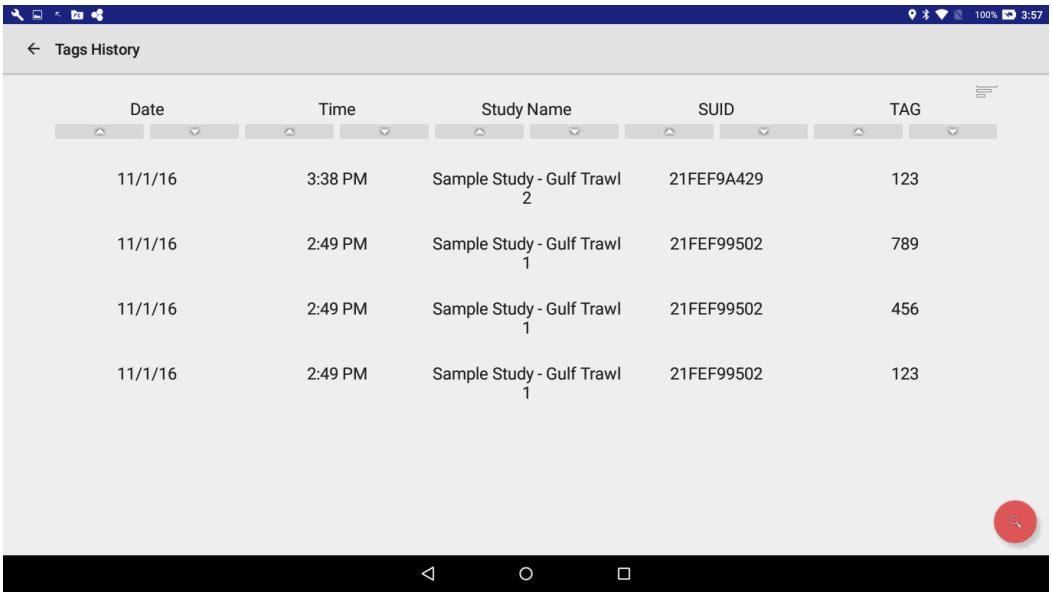
Tag Matches and Viewing

When a tag is found to be matching when a record is made, a dialog similar to the following will be displayed. (Note: This is only an example and yours may look different).



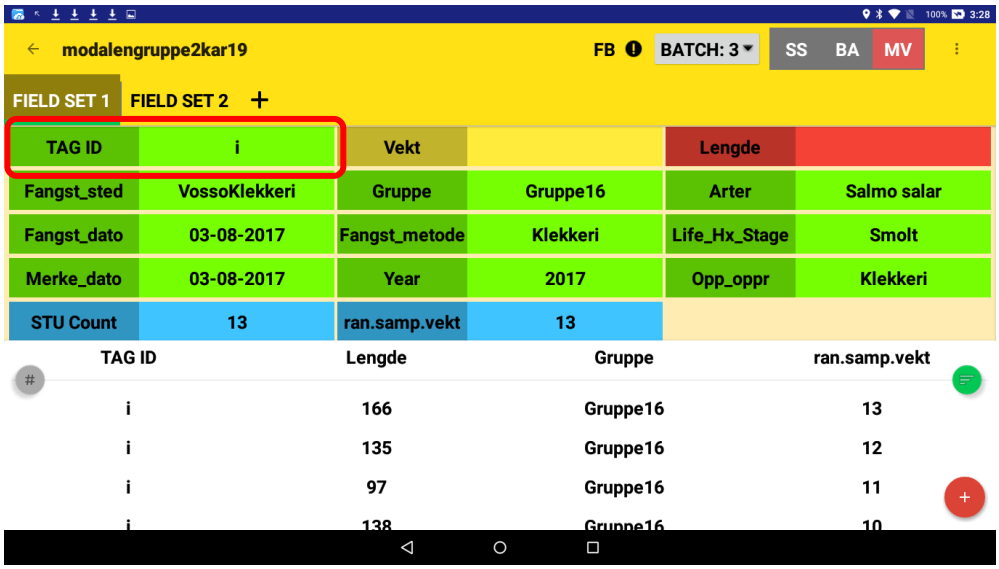
In this example, the user is prompted to move the specimen to bin 3 if it is now over 30 cm in length. Here, the user can also add a note to describe what they did with the specimen. If the user selects "Add A Note" they can then state whether or not they moved the specimen and what the current size is. The entire history of the RFID PIT tag can be viewed by tapping on the "See History" button If a User wants to see all of the recorded tags in the database, then they can tap on the "View All Tags" option in the red "+" expand menu while in the TAGS page in Measurement View.

This will then take the user to a page that displays all of the tag information. The page contains Date, Time, Study Name, SUID, and TAG columns. In this example, the tag values are only 3 digits, for demo purposes.



Importing Historical Tags

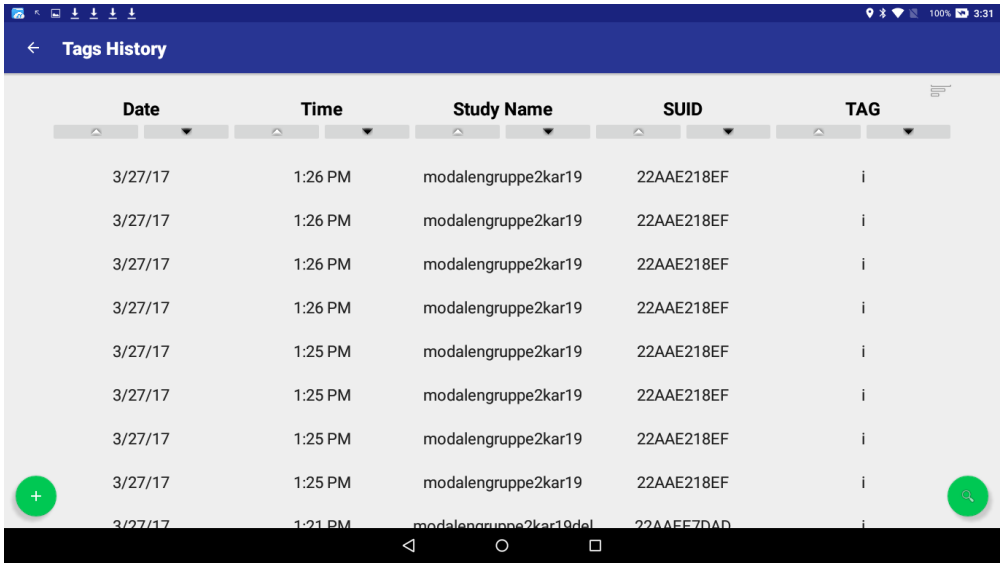
In addition to importing an action list with individual actions per tag, the user can also import a large database of tags into the application. On the Tag History page, the user can track the history of a Tag. In addition to the exported fish-record CSV file, a Tag History CSV file will also be exported when the user exports a Fish-Study package. Historical Tags as well as new scanned Tags will populate on this list. In order to import historical tags, the user should use the import tag history button. Before importing these tags, the user must match up the column header of the imported CSV file to the column header of the Tag field in Measurement view of the Data Collection Software.



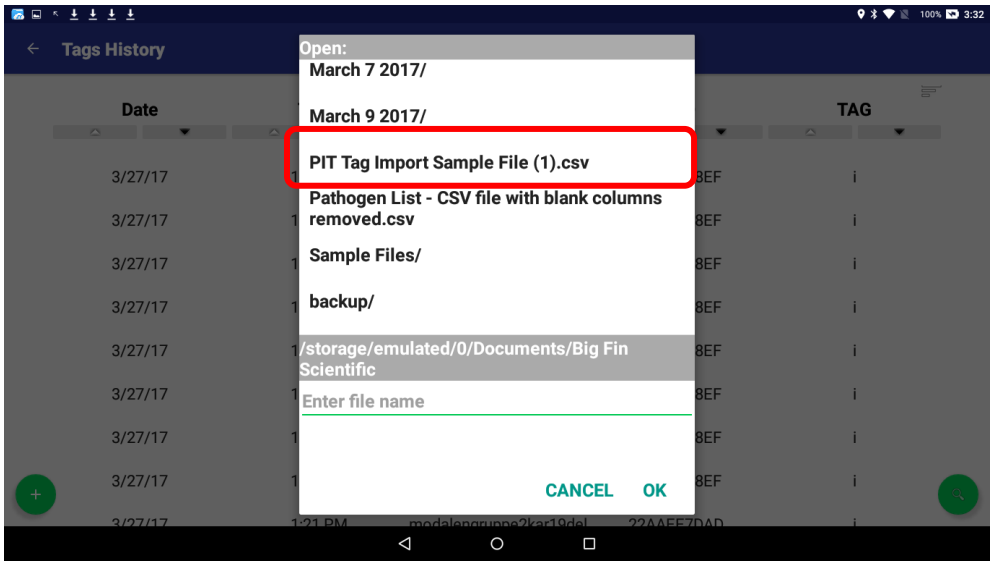
For this example, the Tag Field in Measurement view is named "Tag ID." In order to correctly import historical tags into the application, the user must edit their CSV file to match this column header (not case-sensitive). This is shown in the picture below.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SUID	Tag ID	Study nan	Date	Time	ID	Count	STA	SP Name (	SP Name S	SP CODE	Mesh Size	MT
2	221843B25	3DD.003B(	Dickinson	########	9:39:15	1	1	101	Spotted b	OPANTOS	197	18	
3	221843B25	3D9.1C2D(	Dickinson	########	14:23:33	2	1	101	Spotted b	OPANTOS	197	18	
4	221843B25	3D9.1C2D(	Dickinson	########	14:28:20	3	1	101	White per	MAMERIC	624	18	
5	221843B25	3D9.1C2D(	Dickinson	########	14:29:33	4	1	101	White per	MAMERIC	624	18	
6	221843B25	3D9.1C2D(	Dickinson	########	14:42:19	5	1	101	Southern	AY-GRAEC	696	152	
7	221843B25	3D9.1C2D(	Dickinson	########	14:42:26	6	1	101	Southern	AY-GRAEC	696	152	
8	221843B25	3D9.1C2D(	Dickinson	########	14:42:34	7	1	101	Southern	AY-GRAEC	696	152	
9	221843B25	3D9.1C2D(	Dickinson	########	14:42:36	8	1	101	Southern	AY-GRAEC	696	152	
10	221843B25	3D9.1C2D(	Dickinson	########	14:45:54	9	1	101	Western r	GAFFINIS	744	152	
11	221843B25	3D9.1C2D(	Dickinson	########	14:45:58	10	1	101	Western r	GAFFINIS	744	152	

After the CSV file has been changed to have the same name as the Tag field in measurement view of the application, the file is ready to be imported. In order to import the file, the user needs to visit the Tags page and go to the Tag History Page by pressing the 'View All Tags' button after expanding the red "+" menu on the Tags page.



After selecting this option, the application will prompt the user to select a CSV file. Select the CSV file that you just altered so that the Tag Column name matches that of the field in Measurement View of the DCSLinkStream application.

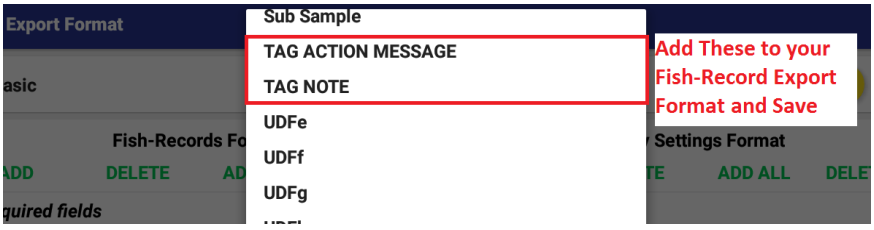


DCSLinkStream will begin importing all of the tags from this CSV file into the application. This import process can take awhile with large amounts of data. After this, the Tags will display on the Tag History page and be linked to the SUID of the study that you imported them into. Historical tag data is generally not modified by the application after it is imported and is not part of the fish database.

Exporting Tag Info in Fish-Record CSV File

After collecting sufficient Tag data, the user can export the **Tag Action Message** and **Tag Note** alongside their Fish-records in the Fish-Record CSV File. To review**, Tag Action Message** is the value that is taken from your imported Action List CSV file. When a match is encountered during data-taking, you have the option to "Add a Note." The "Add a Note" entry will be exported as the **Tag Note.** These values can be added to the fish-record CSV file. To do this, go to the Export Formats page and to your Fish-Record export format.

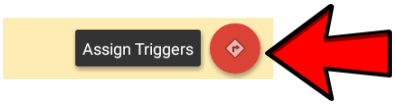
Tap "Add" on your fish-record export format page and add the fields named TAG ACTION MESSAGE and TAG NOTE to your exported CSV file and then tap SAVE on the export format page.



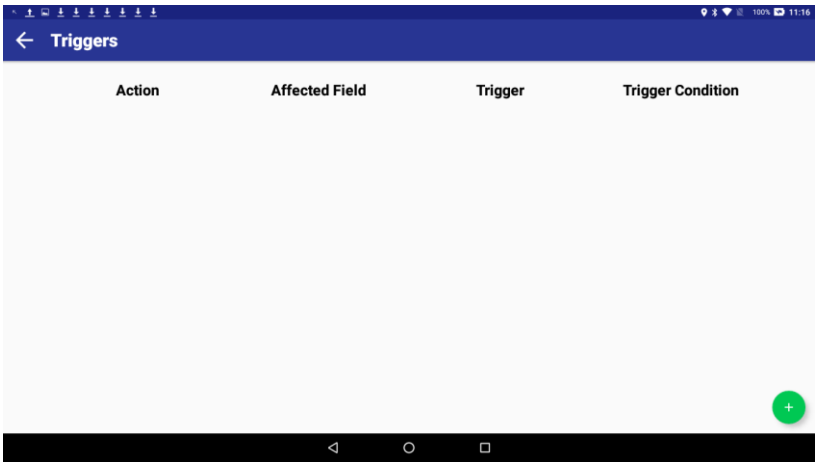
After this, the Tag info associated with each fish-record will be exported along with all of the fish-record data.

Trigger Functions

The application allows you to assign special trigger logic and actions to fields. Triggers give the user a more versatile and streamlined data-collection procedure. The application will automatically 'trigger' an event when certain custom criteria is met that has been set by the user.



In order to access the Triggers page, the user should tap on the red "+" button in the bottom right-hand corner of measurement view and then tap on the "Assign Triggers" option.



Next, the user will see the Triggers screen shown above, with four columns: Action, Affected Field, Trigger, and Triggering Condition.

Trigger Columns Explained

Action

This column represents the action that the trigger will take once the triggering condition is met. Only one action can be assigned per trigger. Multiple actions can be set up for the same triggering condition by creating more triggers.

Affected Field

This is the field that the triggering action will change once the triggering condition has been met.

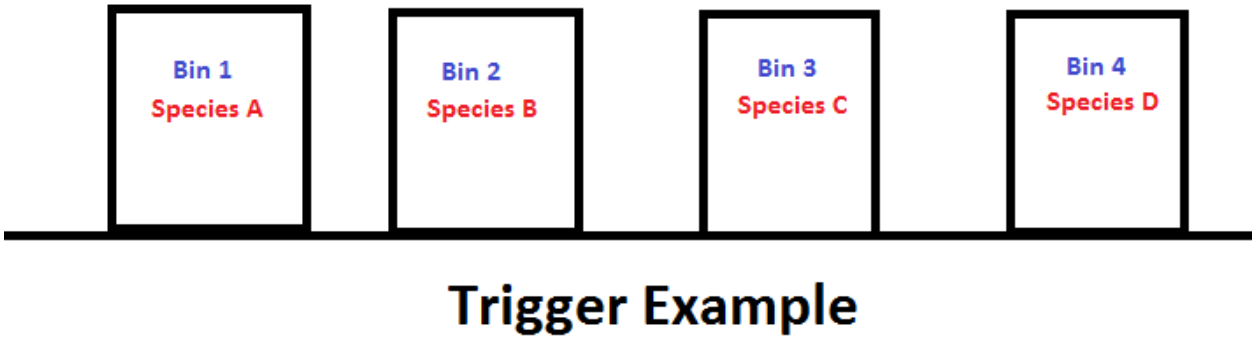
Trigger

This is the input field for the triggering condition. Also termed the "Triggering Field"

Triggering Condition

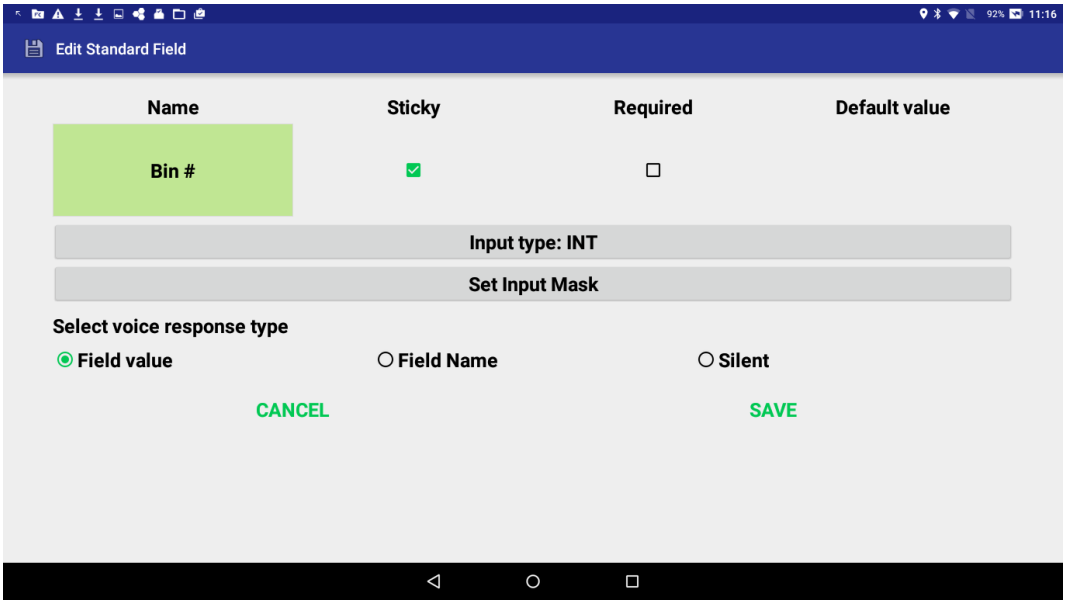
The triggering condition defines when a trigger will occur. When the criterion for this condition is met, the trigger is activated.

Trigger Example



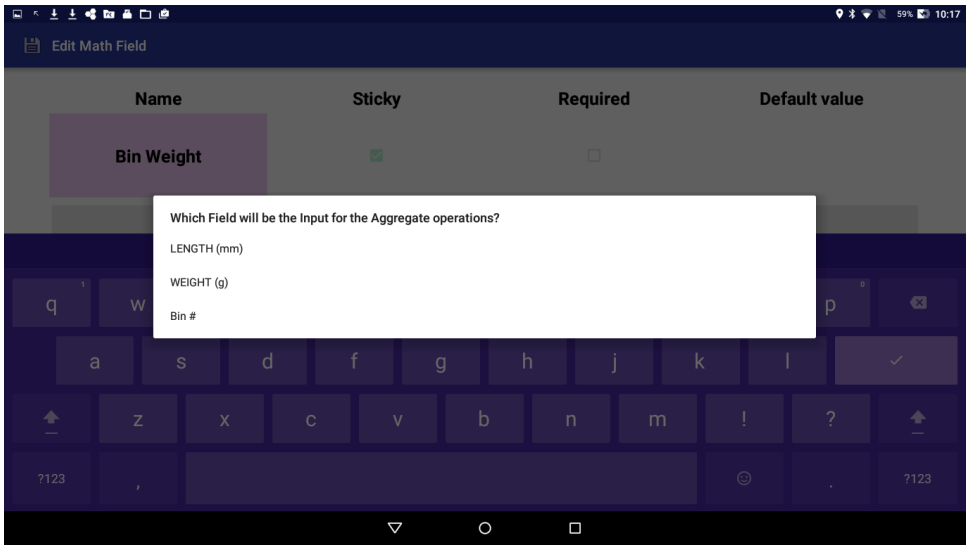
Trigger Example

In this example, we have a large quantity of fish separated into bins. Each bin contains only one species of fish. We want to know the total weight of each bin while also categorizing each bin with an identification number. We start by creating a string/decimal/integer field called "Bin#"

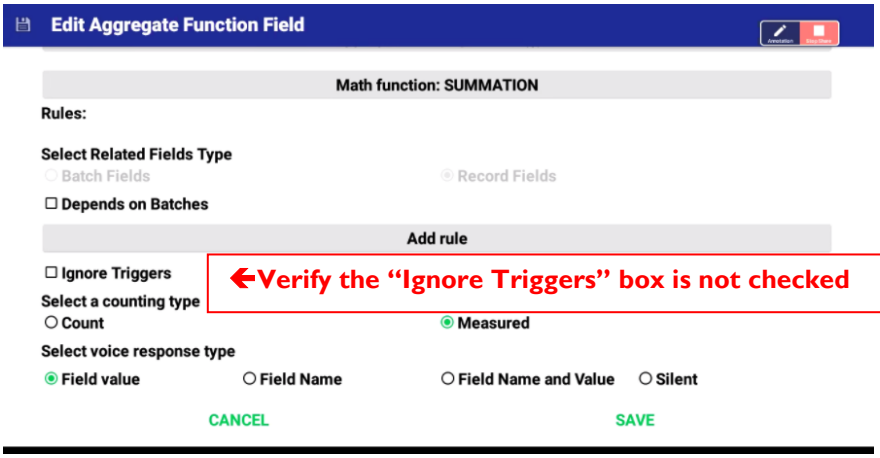


and check "sticky". Next, we change the **Input type** to "integer" to accept numeric input without a decimal point. Save the field, which closes the dialogue.

Next, create an Aggregate field type and name it "Bin Weight."

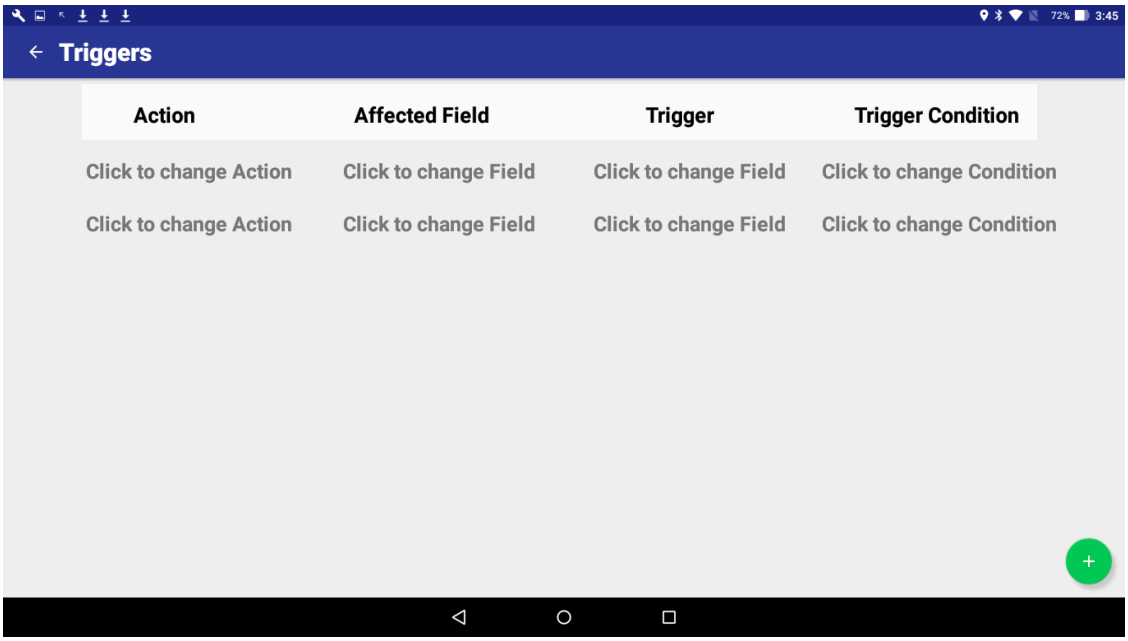


The Aggregate field dialogue prompts you for which field you'd like to be the input for the aggregate operation. Select "Weight(g)".



Next, we select the type of Aggregation function you'd like. Select Summation for our example. We verify that "Ignore Triggers" is not checked.

Now, let's assign our triggers. We go to the Triggers page by tapping the red "+" button at the bottom of measurement view.



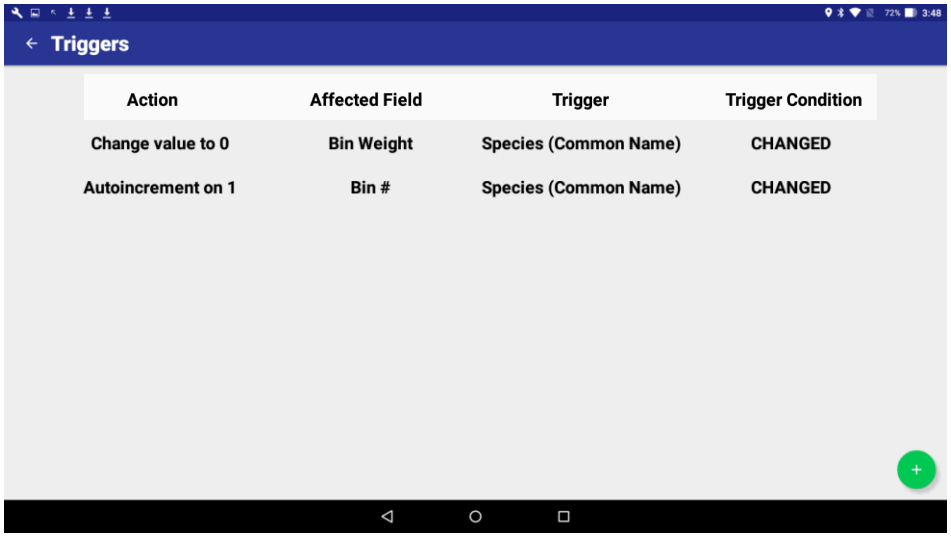
Each tap of the green "+" button on this screen creates a blank trigger (row). Tap it twice to add two new triggers. Now, we work from left-to-right to define the triggers. **Action** should be set first, followed by **Affected Field**, then the **Trigger**, and finally **Triggering Condition**.

In this example, we want to assign a trigger for the 'Bin #' to increase by a value of '1' every time the species changes, so that Bin #'s automatically increment with species changes.

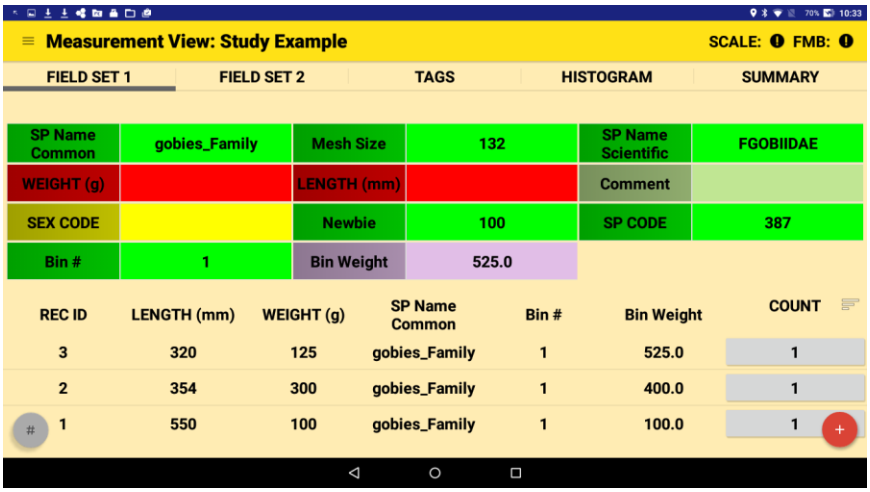
We select **Auto-Increment** as the **Action**, and enter a value of 1 (one) for the increment value. That is, each time the trigger is activated, the **Affected Field** will increment by a value of 1. Next, we choose "Bin #" as the **Affected Field**.

Now we select **Changed** for the **Triggering Condition**. This means that whenever the **Triggering Field** value changes, the **Action** we specify will occur on the **Affected Field**. Next, we select the Species field as the **Triggering Field**. In this example, the species field is named "Species (Common Name)" and it is a sticky field linked with an auto-fill list. The first trigger is done!

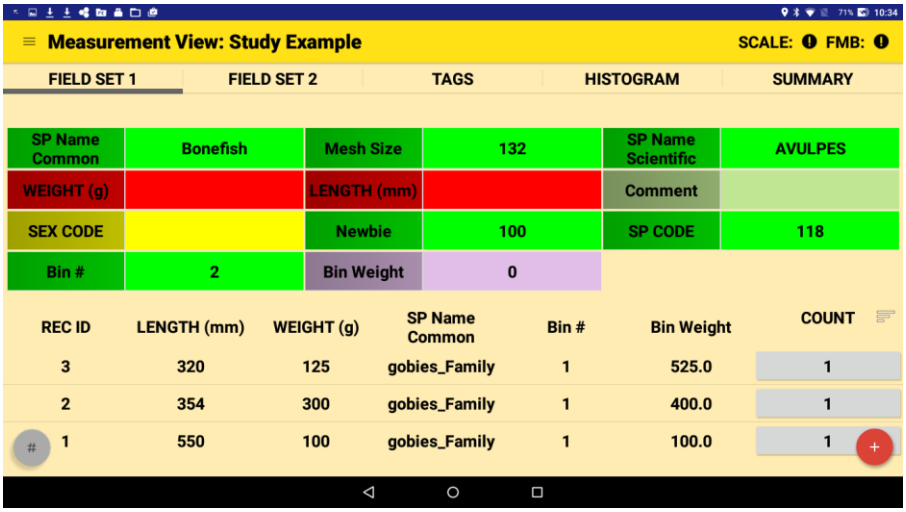
In order to get the "Bin Weight" field value to reset to 0 after each species change, we set up another trigger. Following similar steps to what we did above, by working from left-to-right on the triggers page filling out **Action** first and then **Triggering Condition** last. The following screenshot shows what the Trigger page looks like after setting up both of these triggers.



The **Triggering Condition** and the **Trigger** are the same as the Bin # trigger because the user wants the "Bin Weight" to change with the same conditions as the 'Bin #' increment. The **Action** set for "Bin Weight" is to change the value to "0" whenever the **Triggering Condition** is met. Now both triggers are set and ready to use.



Back in Measurement View, we start at a value of 'Bin #' equal to 1. The first Bin contains a "Gobies Family" for species. During record taking, notice that the "Bin Weight" continues to aggregate the weight of the Bin1 specimens.



After we finish with the first species, we move to "Bonefish". When we change the species (i.e. SP Name Common), "Bin #" increments from 1 to 2 and the "Bin Weight" resets to "0." Looking at the Record List at the bottom of the page, you can see that the Bin Weights are still recorded for Bin 1 but now a new "Bin Weight" has started aggregating for Bin 2.

Trigger Functions give you the ability to streamline your data collection procedures as well as reduce errors by automatically changing fields when certain criteria have been met.

Using the Fish-Board

Data-Entry with the Fish-Board

Data-Entry Modes

The application supports several data-entry modes from the fish-board. These modes are actuated by "Swiping" on the board, which is described below.

There are 3 Modes on the standard DCSLinkStream models (custom decals can be created for you, which may change this). On the pictured decal, there are 3 modes to choose from:

- Length-Measurement (Yellow "Swipe Zone")
- Alpha (Blue "Swipe Zone")
- Numeric (Green "Swipe Zone")

Length-Measurement Mode

In this mode, none of the alpha keys, numeric keys or shortcut keys function. Instead, the application is expecting a length-measurement from the fish-board and will populate the Measurement View Length field with a value when a stable stylus is detected.

Alpha Mode

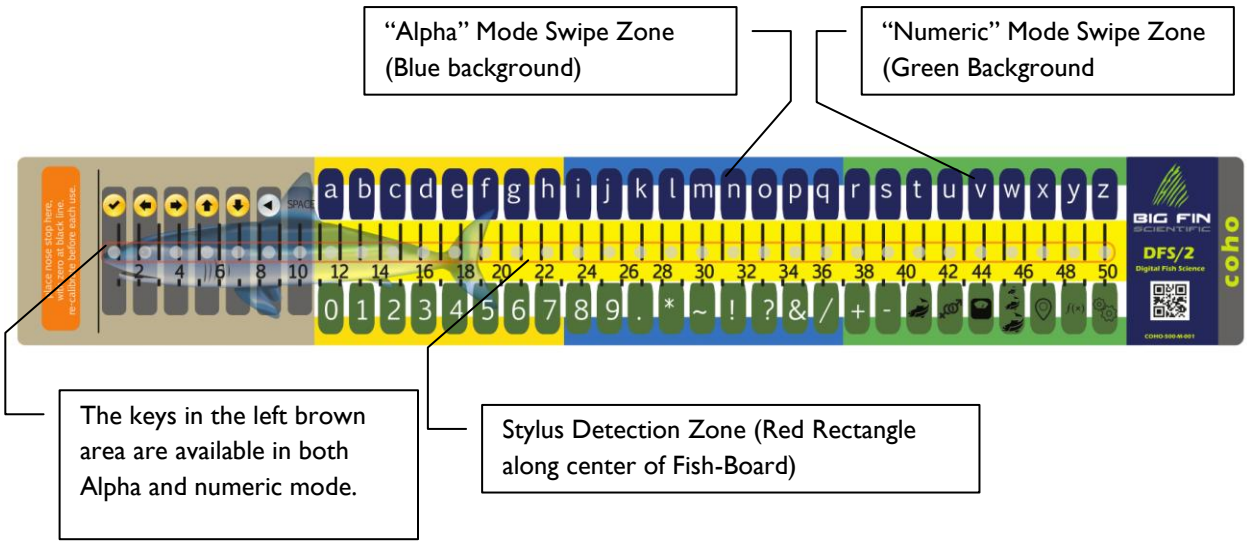
In this mode, alpha characters, shown in this decal picture as those keys with a blue background (A-Z) can be entered with the stylus. Length measurements cannot be taken.

Numeric Mode

In this mode, keys with a green background are active, so numbers and shortcut keys are active. Length measurements cannot be taken.

Swipes and Swipe Zones

In order enter and exit data-entry modes, we use "swipe" motions with the stylus.



Note: Right-swiping is to place the stylus down on the measurement surface of the fish-board, then move the stylus to the right, still in contact w/ the measurement surface, then move the stylus away from the measurement area, as if you were pushing something with the stylus along the top surface of the board. Left swiping is the same but in the opposite direction.

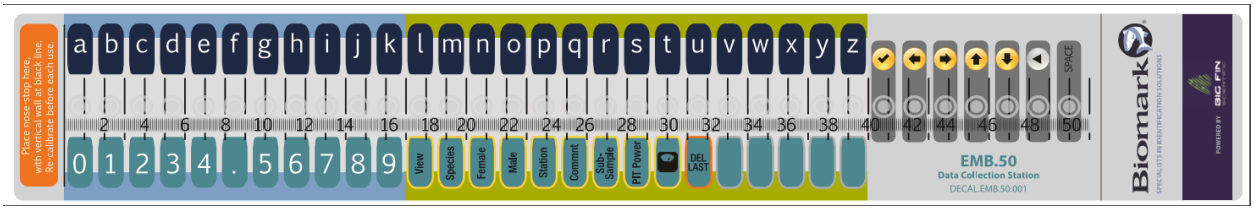
Right-swiping is used to switch between available entry modes. The description of "entry modes" varies with the decal applied. In the example decal above, we have 3 modes: Measurement (Yellow), Alpha (Blue) and Numeric (Green). When in Measurement mode, we're entering measurement values to the DCSLinkStream app. When in Blue mode, we're still placing the stylus along the center stripe, but we're sending alpha keys to the DCSLinkStream app, seen along the top of the decal in dark blue. When in Green mode, we're sending numbers, special keys and shortcut keys to the DCSLinkStream app, seen along the bottom of the decal in dark green.

To switch between various modes, right-swipe starting somewhere in the area corresponding to the color of the functions you want. For example, right swipe starting somewhere in the area with the light green background to change to the Numeric/Special-Keys/Green mode. A right-swipe in the area with the light blue background will cause DCSLinkStream to go to Alpha Mode. Left-swiping anywhere (or right-swiping in the Yellow Zone) will bring you back to Measurement Mode.

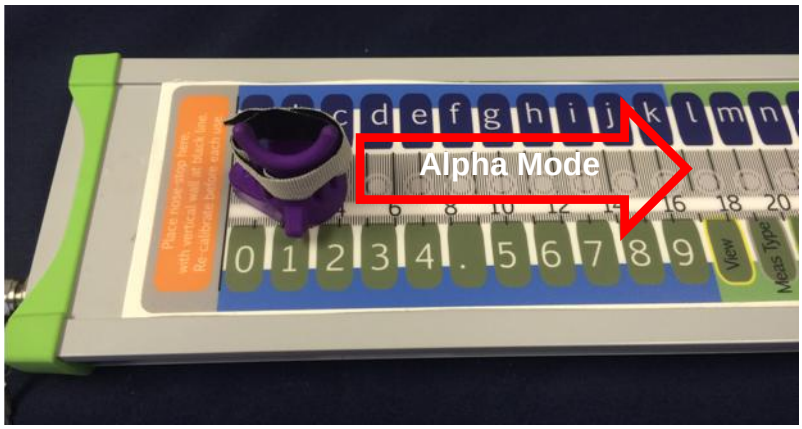
The tablet application reacts to your swipe motions by changing the color of top bar of the application (the "action bar") to match the mode you're in. You'll also see a temporary message that you've changed modes.

Remember that the only sensing area on the board is in the center, so swipes must happen along the center, in the narrow area depicted on the decal as a red rectangle. When in an entry mode other than Measurement, use the circles or bullseye marks along the center stripe to guide your stylus. Place the center of the magnet to the center of the circles.

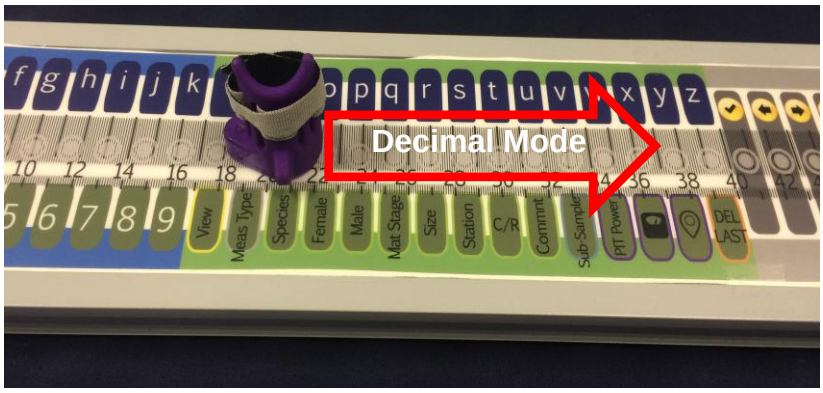
Note that different decal models may have different swipe zone configurations.



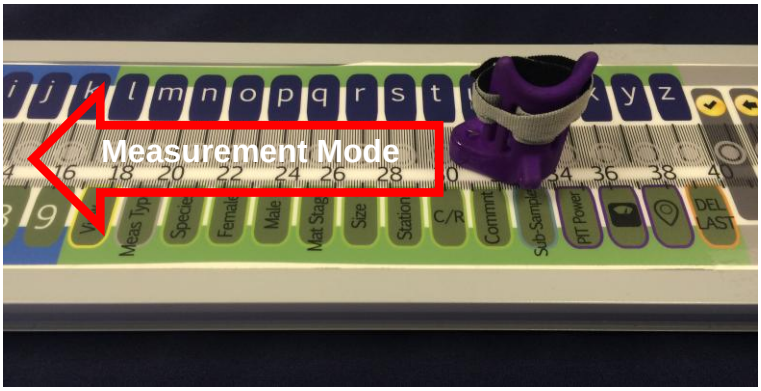
For example, the swipe zone configuration on the EMB.50.001 Decal pictured above is different than the configuration of the model on the previous page.



Swipe right in Blue Zone → Alpha Mode. In Alpha mode (or more generically, "Blue" mode), placing the stylus at the bullseye marks along the center will cause the symbol in the dark blue label above to be sent to DCSLinkStream (A-Z on this decal).



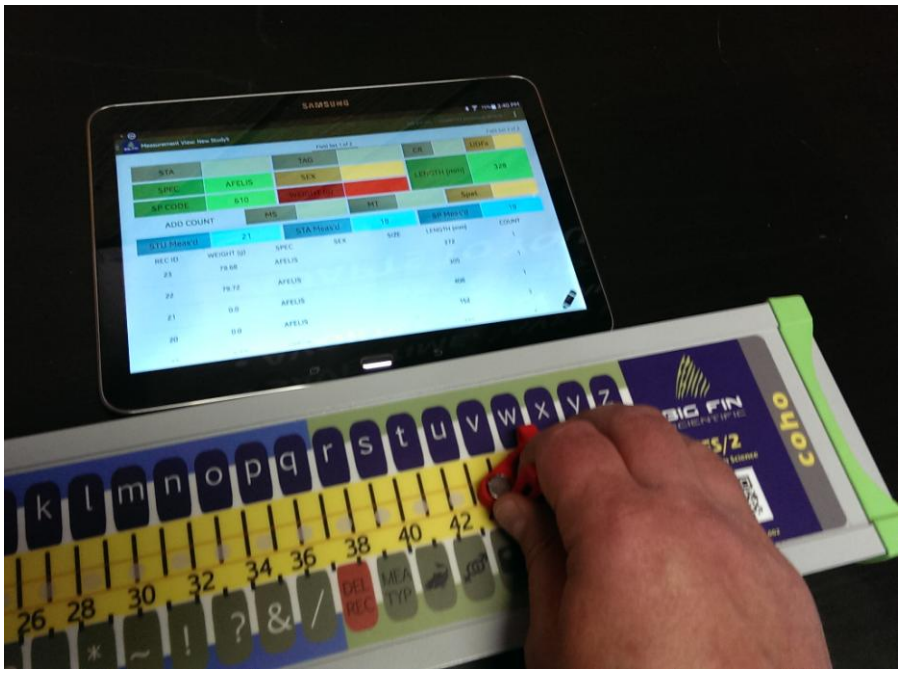
Swipe right in Green Zone → Decimal Mode. In Decimal mode (or more generically, "Green" mode), placing the stylus at the bullseye marks along the center will cause the symbol in the dark green label below to be sent to DCSLinkStream (0-9 plus special characters and shortcuts on this decal).



Swiping left anywhere on the board → Measurement Mode

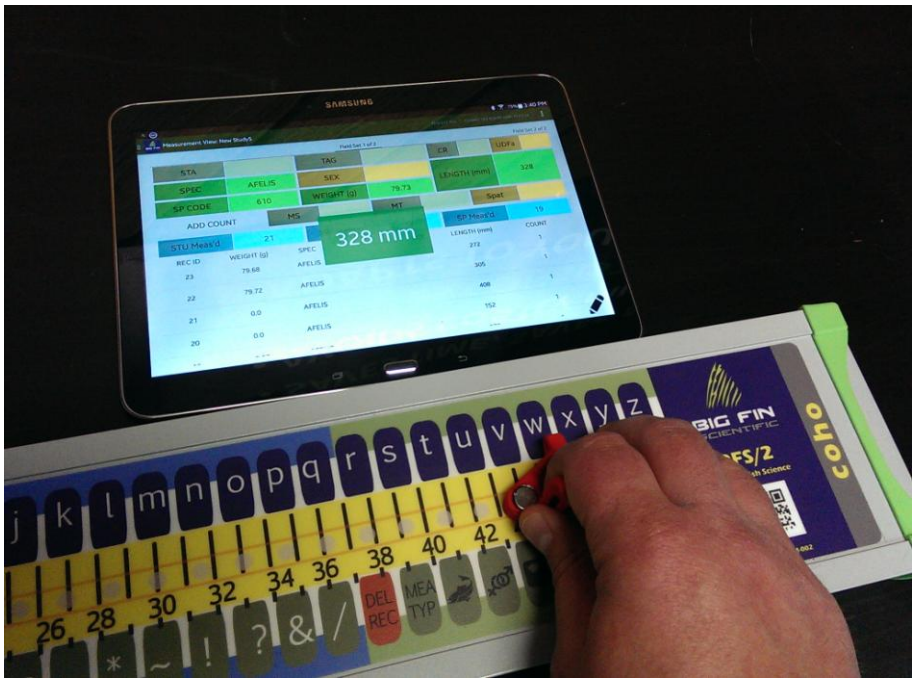
Examples of Use

Let's start with a popular function: Retrieving a weight from a connected scale. (First, connect a Bluetooth-enabled scale in App Settings/Peripherals.)



Here, the user has already taken a length measurement and has just "right-swiped" in the Green Zone. The "Action Bar" at the top of the application will message the user which mode is currently active by changing to the mode color (in this case a dark green).

Next, the user selects the scale shortcut key.



The application reads the connected scale and populates the weight field w/ the received value. The fish record is complete (all required fields are now filled), so the application flashes the measurement value in large letters (white on green in center), populates the table below with the new record and resets the measurement view for the next record.

The mode will automatically change back to Yellow / Measurement Mode, ready to accept the next fish-length.

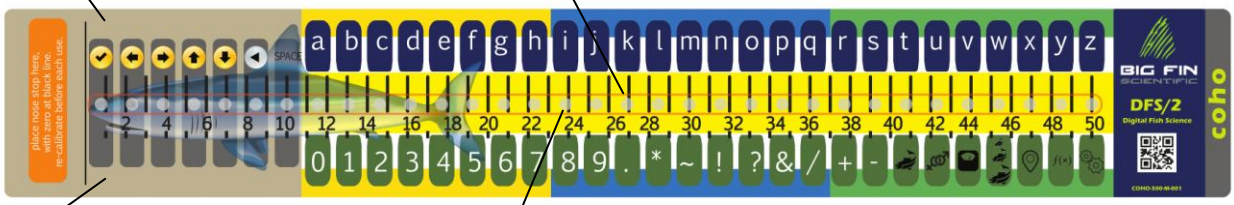
Note: Recent versions of DCSLinkStream show something other than the measurement value when the record is completed. You may see "Count=1" or something similar in the green box described above.

Note: To get out of dialogue boxes (cancel) or to return to the default mode (Measurement Mode), left-swipe anywhere along the board.

How to Select Keys

The keys in the left brown area are available in both Alpha and numeric mode. This area may also be silver/grey on some decals

When selecting a key, for example the letter K, cover the white circular area with the stylus. The center of the rounded portion of the stylus should be concentric w/ the white circle. It doesn't have to be exact.



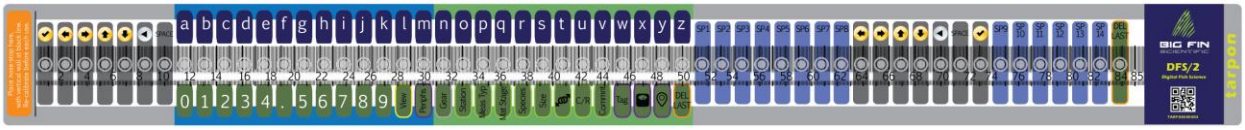
The check-mark button means "accept" or "done", the gray left-arrow means back-space. On some decals, some symbols are repeated in different areas of the decal, for convenience.

Selecting this location with the stylus would cause an "l" to be entered in Alpha mode and an "8" in Decimal mode.

Note: The stylus is only detected along the center of the board, so swipes and key-hits must happen along the center, in the narrow area depicted on the decal as a red rectangle.

Key-Mapping Screen (Assigning Shortcuts)

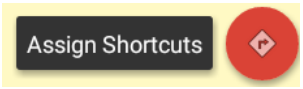
This screen allows the user to map custom functions (shortcuts) along the length of the fish measurement board. The key-mapping functions allows you to avoid touching the tablet touch-screen and, in conjunction with audio feedback, allows for heads-down operation. Key-mapping can be implemented along the entire fish measuring board and any key can be re-assigned, no matter what might be showing on the decal. The decals have default hotkey assignments but all keys can be changed to the user's preference.



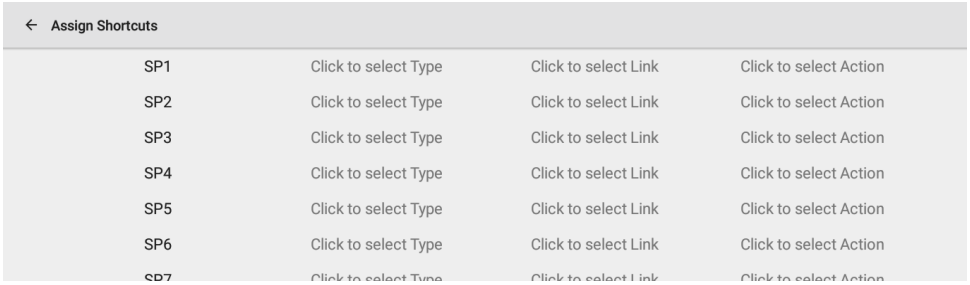
Important Note: *You should select which decal is affixed to your board in Application Settings -> Decals -> Select Decal Type. There will be an identifier code on your decal, which you'll pick from the list in the App. If you do not see the decal on the App list, tap on "Update Installed Decal Definitions from Web-Server", which will download all the decals that are on the Big Fin Scientific server and will update the decal list in the App.*

Assigning Key-Mapping Functions

To assign your shortcuts, bring up the Key-Mapping Screen by pressing the red "+" button at the bottom of *Measurement View* or *Study Settings* pages and then tapping "Assign Shortcuts" option shown in the picture below.



The key-mapping screen displays key labels which correspond to the decal you selected in Application Settings/Decals. You'll assign a Type, Link and Action to the various keys, as described below.



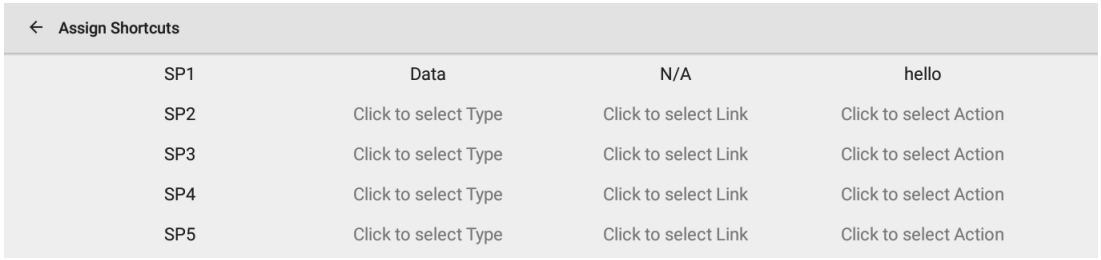
Action Types

There are five different Action Types that can be selected for shortcut key assignment.

- ***Data***
- ***Hardware***
- ***Navigation***
- ***Show Field Dialog***
- ***Field Direct Entry***

Data

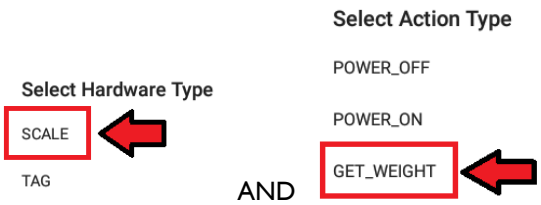
The Data action type allows you to define a character, symbol or set of characters to be sent to DCSLinkStream when the key on the board is pressed. For example, if you were to open a field dialogue for data entry and then tap a Data hotkey, the field dialogue will be populated with the characters or symbols you've assigned to the hotkey.

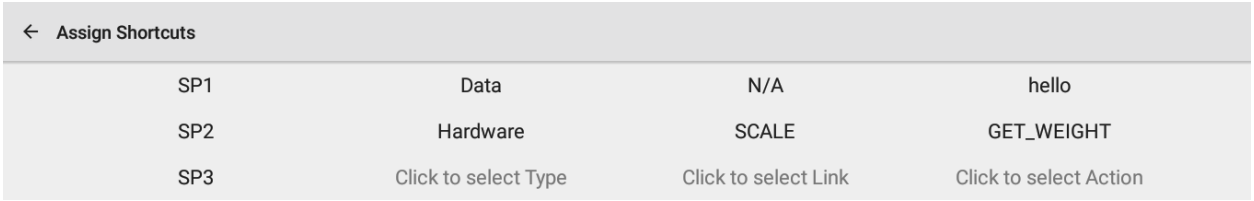


In the picture above, the SP1 key is given a Data type filled with a string value of "hello." So, if the SP1 key is pressed after opening a field dialogue, the field will be populated with "hello". The Data key type allows you to enter long strings or codes quickly into various fields.

Hardware

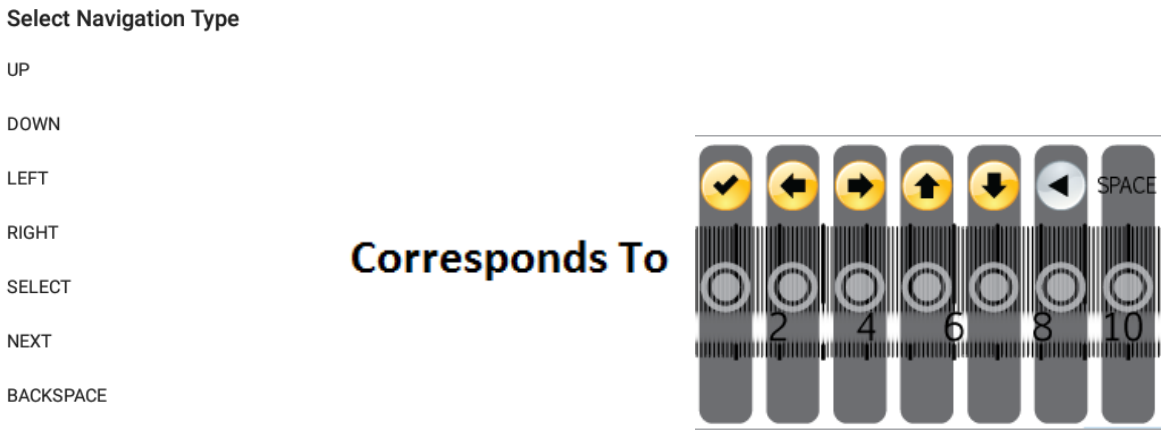
Hardware action types allow you to define a hardware-related action for a key. For example, you might define a key action to "GET_WEIGHT" for a Weight-Scale which you've linked to DCSLinkStream. Now, every time you tap that hotkey, DCSLinkStream will query your scale for a weight and populate the hardware-linked field with the received value.





Navigation

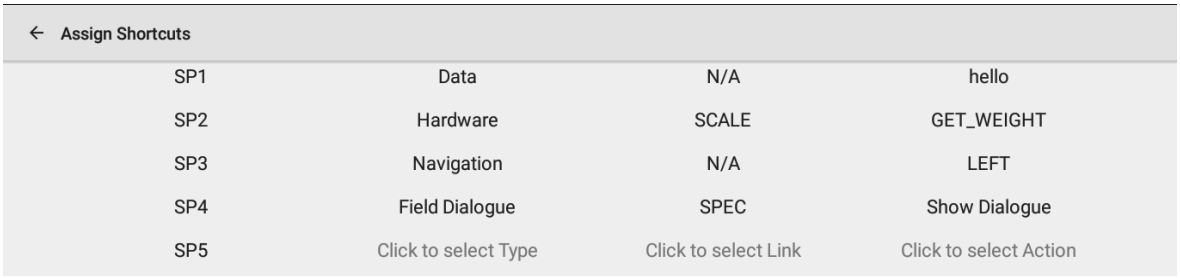
Navigation action types allow you to move around in the DCSLinkStream app without touching the tablet. The different navigation selections are shown below:



These different navigation type selections allow the user to navigate between fields using the hotkeys while in Measurement View and Study Settings. These selections also help with text manipulation when a field dialog has been opened.

Show Field Dialog

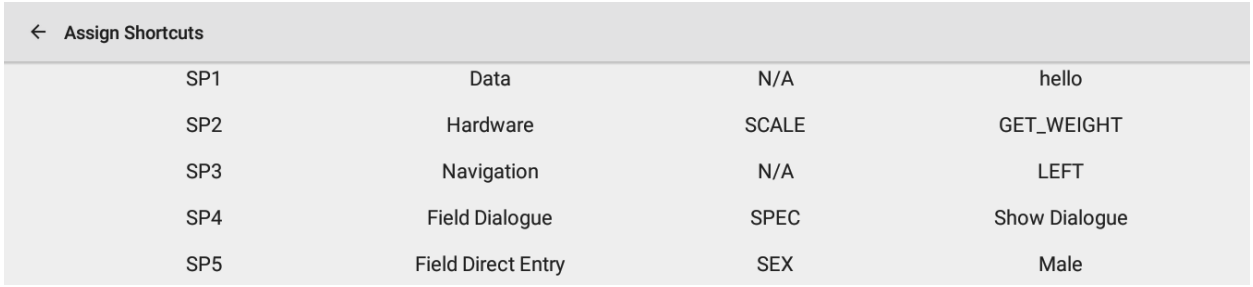
The Show Field Dialog action type will open a designated field for subsequent data-entry, either by hotkey or manually.



In the picture above, the SP4 hotkey has been defined to show the 'SPEC' field dialog when pressed. This gives you quick access to the fields you use frequently. This feature is especially helpful if you have an auto-fill list you've defined for a field. When you press the hotkey, the field will open along with the auto-fill values for the field, so you can scroll through to make your selection. You can use shortcut navigation keys to scroll through the selections, so you can avoid touching the tablet touch-screen.

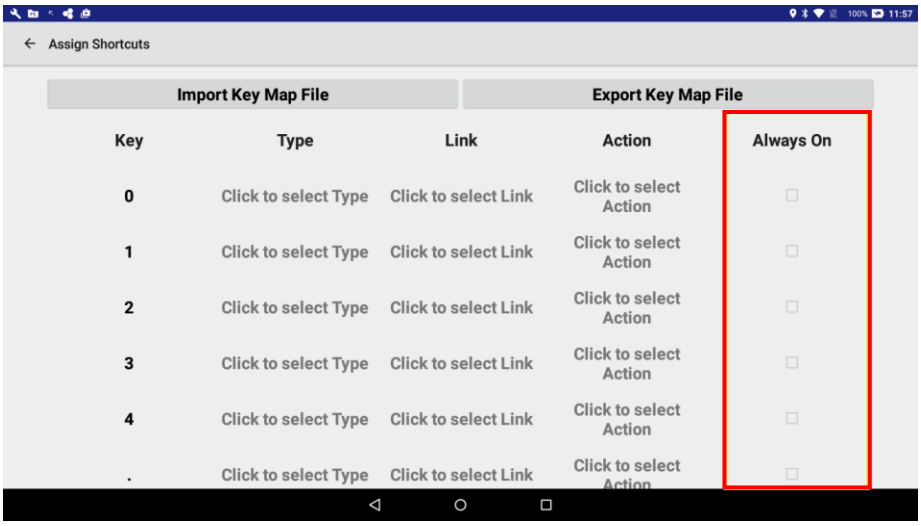
Field Direct Entry

The Field Direct Entry action type allows you to define a value to be entered directly into a target field. While the Field Direct Entry is similar to the Data Entry type, it differs in that Field Direct Entry is narrowly defined to a specific value and a specific target field. No dialogue box is involved; instead, the pre-determined value gets filled to the field directly.



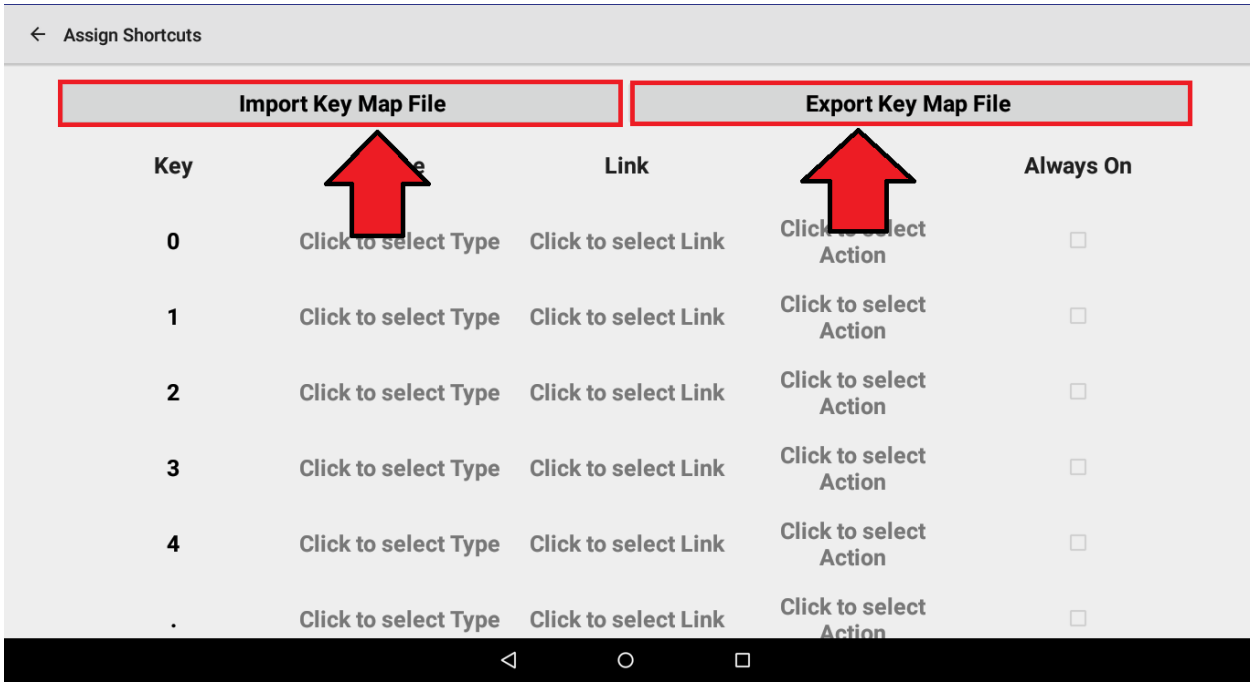
The picture above illustrates a Field Direct Entry action type for SP5 hotkey. The SEX field has been linked to the hotkey with the value as "Male." Pressing the SP5 hotkey causes the SEX field to be filled with a string value of "Male."

Always On Switch



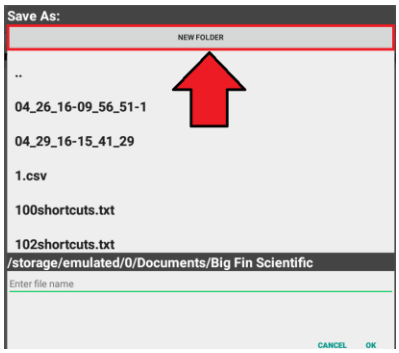
The "Always On" function causes that hotkey to always be active, no matter the mode the board is in. This means on the one hand that the board will no longer take length measurements near the designated 'Always On' hotkey locations. On the other hand, accessing the hotkey will not require setting the appropriate mode with a right-swipe. This feature may be useful if your study is composed of animals which rarely use some portion of the measurement board for measurements (ie, small fish) and you wish to avoid mode switching.

Exporting and Importing Key Map Files



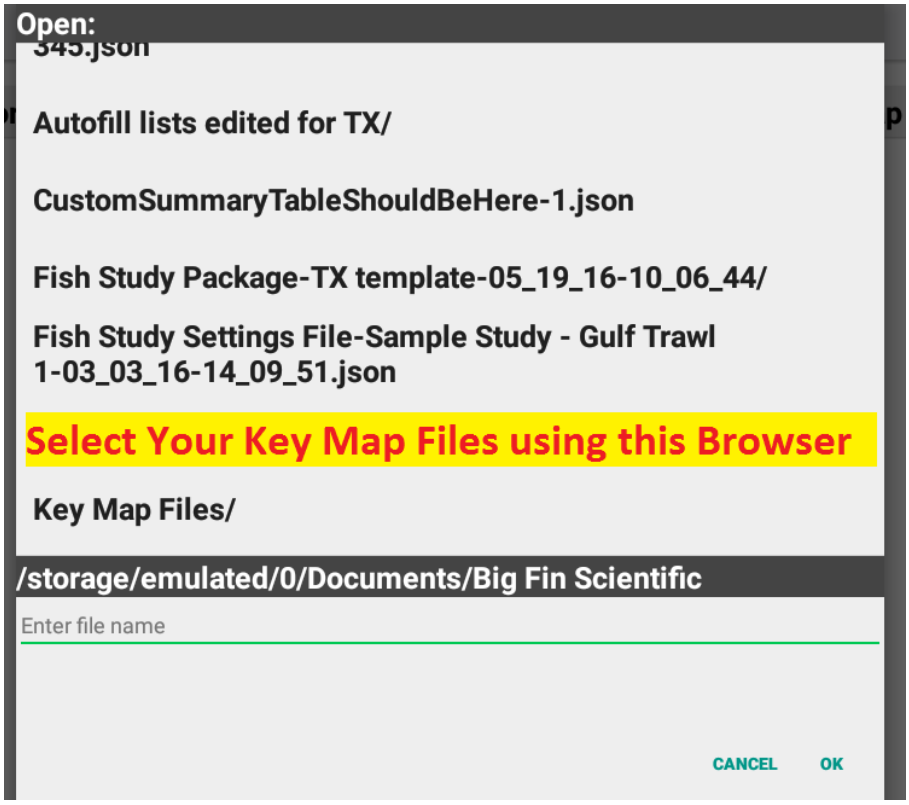
The picture above shows the location of the import/export Key Map File buttons on the 'Assign Shortcuts' page. These buttons will allow the user to save their custom hotkey assignments as well as import them into any number of new studies.

First, tap on the "Export Key Map File" selection. This will open the dialog shown in the picture below.



It is recommended that the user creates a new folder for key mapping files. If a new folder is not selected, the key map file will be saved in the Big Fin Scientific folder within Documents by default. These key map files appear the same as the Study Settings files (they're both "JSON" files) so it is important to give them a unique name and/or location so you don't get them swapped.

To use a keymap file you created in another study, go to the study you want to update and tap on the "Assign Shortcuts" button. Select the "Import Key Map File" button. This brings up a browser that looks like the following:



This browser will start in the Big Fin Scientific folder located in Documents. Browse to find your file, tap "OK" and your hotkey assignments will be loaded. If you're importing someone else's keymap file, remember that they might be using a different decal, so the key labels might not match what you have on your board. The key-map assignments may still work for you (many decals have the same spacing), but the key labels may not match. In this case, you can always write new key labels on your decal with a permanent marker or label-maker or call us for a new decal.

Suggestions and Feedback

If you feel anything can be improved, we want to hear from you! Most of our feature improvements come from our users, so please let us know what you want to see. Feature requests and "bug" reports can be made here:

Feature Requests and Bug Reports Online Form

If you have any questions or comments about the product or this document, please contact Big Fin Scientific at: info@bigfinscientific.com or 512-808-0346 (8080-FIN).