User Guide

396-001770

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System Overview

The QuickDraw spray tender system makes the process of tendering your sprayer less time-consuming, more accurate, and more consistent, and provides a historical record of each batch. The system allows the batching of either 4 or 6 bulk products, depending on which model was purchased, plus 5 manual products. The QuickDraw controller along with the accompanying iPad app work together to simplify the management of your sprayer batches. Configuration of recipes can be handled in either the QuickDraw controller or on the QuickDraw iPad app. The QuickDraw app is the preferred method for recipe configuration due to its portable nature and ease of use. The QuickDraw app communicates with the QuickDraw controller via WIFI. The QuickDraw controller takes these recipes and automatically handles the calculations and measurements necessary to complete a batch that ends up in the sprayer. Once a batch is completed, the information for that batch is logged in the controller. The QuickDraw app can then be used to load the historical information out of the controller. This historical data can then be sent by email as a csv file that can be opened with Excel or as a PDF report.

The QuickDraw has the ability to manage bulk products automatically. These are products stored in bulk containers or shuttles. The QuickDraw also has the ability to keep track of how much powder product and non- bulk products are used in any batch. In this system the non-bulk and powder products are called manual products. The system can keep track of up to 5 manual products per recipe.

Mass Meter Description

The QuickDraw takes advantage of mass meter technology to provide accuracy to the spray tendering system. The mass meter in the QuickDraw uses the Coriolis Effect to determine the mass and density of the product running through it. This can then be converted to volume and used for batching a specific volume amount. Other flowmeter technologies have the disadvantage of being affected by density and/or temperature changes whereas the mass meter accuracy and repeatability is not affected by changes in viscosity due to temperature and changes in density due to product differences. In a batching system like the QuickDraw where product is diluted immediately by loading directly into a carrier stream, calibration is not feasible. The mass meter allows the QuickDraw to be accurate from product to product and from run to run and from morning to afternoon without recalibration.

QuickDraw and iPad

The QuickDraw is designed to be used with an iPad. Creating and editing recipes, managing farms, fields, and products, configuring totes, and setting up batches can all be done on the QuickDraw controller, but are best done on the iPad app and transferred by WIFI connection to the QuickDraw controller. Batch history must be downloaded to the iPad to be accessible outside the controller. If an iPad is temporarily unavailable, the QuickDraw controller is fully functional without the iPad.

Batches less than 150 gallons may not have time to dispense all the chemicals desired before the Total Carrier amount has been pumped. The carrier is pumped at approximately 40 gallons per minute while the products are being dispensed through the Venturi system. Also, batches that have 35% or more of

the batch volume from the chemical products may not complete. The message *Batch Unlikely to Complete, >65% of the Total Batch needs to be carrier in order to guarantee batch success* will display if such a batch is set up.

Air Leaks The QuickDraw will not work properly if there are any air leaks in the plumbing on the suction side (from totes or shuttles to the pump). Air leaks will create pump priming problems and will cause the flowmeters to behave erratically. It is essential that all hoses and connections be airtight.

The QuickDraw should only be used with a wet-seal pump.

Initial Tote Setup with iPad

Follow these steps to set up the chemicals with the correct totes/valves for the QuickDraw controller. **Valve #1/Tote #1 is a larger valve than the other product valves and should be connected to the highest volume product or to the thickest, hardest-flowing chemical.**

It is absolutely essential before each batch is run to verify that the recipe being used has the chemicals matched correctly with the valves they are connected to, as shown on the QuickDraw Run Screen.

On the iPad, the Tote Setup can be done by creating a new Recipe. If the same set of chemicals will be regularly used, a base recipe can be set up to store this configuration. This base recipe can use the QuickDraw *Duplicate Recipe* feature to make variations of the recipe using this same set of chemicals.

1. Download and install the QuickDraw iPad App if this has not already been done.
2. From the QuickDraw Menu Screen, select **RECIPES –NEW.** Call the **Mix Name:** Base Setup 1 (or anything else you would like to call it). (Lower the keyboard to accept the entry.) Put in a **Carrier Name** (probably Water). (Lower the keyboard)
3. The next two rows can be filled in now or they can be left blank and filled in for each recipe.
4. Press on the blue box at the top of each tote to set up the tote with the correct product. Press **Find Chem**, select the chemical, then press **Load to Tote**. **Rate** does not need to be set now. **Delay** (for rinse) should be set to at least 3 seconds for each product. Press **Man. Prods** in top right corner to add Manual Products (non-bulk, powder, or low volume amounts). Next to **Order**, enter a number for each product (beginning with 1) to indicate what order the products will be entered into the mix. **Save** when finished.
5. To create a recipe using the Base Setup, select **Recipe—New—Duplicate**. Select Base Setup 1 (or whatever you named it). Enter a name for this recipe. The details of this recipe can then be entered. If a particular product that is set up will not be used in a recipe, simply set the **Rate** to 0, and that product will not be used. **Save** when finished.
6. Connect the iPad to the QuickDraw controller by WIFI. **Sync Mixes** to move recipes from the iPad to the controller.

Get Started

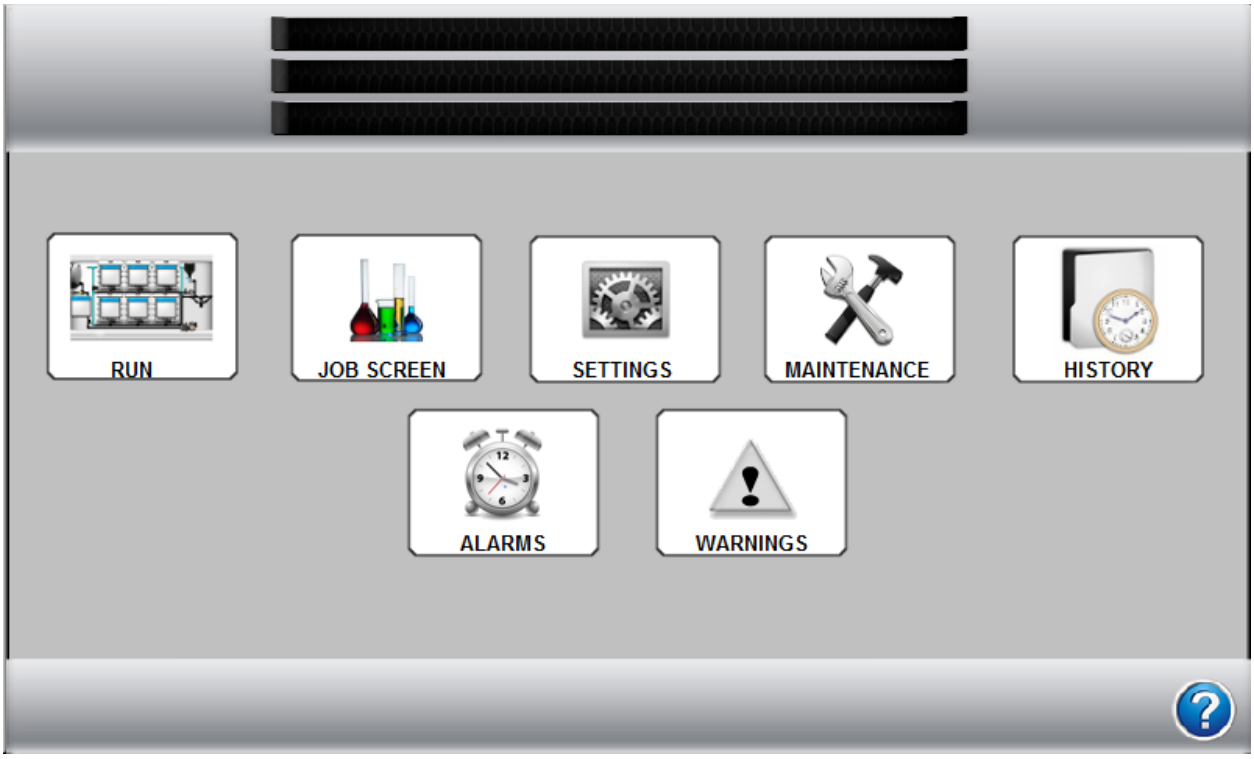
1. Download the QuickDraw iPad app. See pages 30-32. Check for updates if you have the app.
2. Open the iPad app. Start with **Operations.** See page 36. Set up a farm or farms, and fields. Farms and Fields can be added/edited later.
3. On the **Operations** page, press **Add/Edit Product,** then press **Find Chem**. Scroll through or search this list to see if the chemicals you use are here. If not, press **Import New From Greenbook**, and search to find the chemical you want to add.
4. In Operations, set up **Default Email** to where you will regularly want to send exported information or batch histories.
5. Create a new recipe. **RECIPES: New** See pages 34 and 35. Put in the Mix Name and Carrier Name (Lower the keyboard after each entry). Total Gallons, App Rate, Carrier Rate, Calculation Mode, Total Acres, and Carrier Preload can be set now or later. Press on the **blue box** at the top of each tote to set up the tote with the correct product. (Be sure the product is associated with the correct Tote Number. *Tote 1/Valve 1 is a larger valve and should be used with larger volume or harder flowing products.* Press **Find Chem**, select the chemical, then press **Load to Tote).** Set the **Rate** and Mixing **Order**. **Delay** (for rinse) should be set to at least 3 seconds. Add Manual Products (non-bulk, powder, or low volume amounts) on the next screen. Include Manual Products in the Order. **Save** when finished.
6. Set up the WIFI connection between the iPad and the QuickDraw controller. The controller must be turned ON to do this. On the iPad, go to **Settings—WIFI—Choose a Network.** Network is *QuickDraw*, Password is *SureFire*.
7. **Sync** the iPad and controller. On the iPad, press **Operations**. Press **Sync Farms, Sync Fields, and Sync Products** (these need to be done one at a time). Go to **Recipe—Edit**. In bottom right corner of big screen, press **Sync Mixes**.

Running a Batch

1. Turn on the QuickDraw controller.
2. Open the **Job Screen**. Select the **Farm, Field,** and **Recipe.** Enter the **Temp, Wind Direction and Speed.** Enter **Preload Volume** if you want to put some carrier in the tank first.
3. Verify **Product Names and Tote #s**. Be sure that the products are matched with the correct Tote/Valve numbers.
4. Verify correct **Rates.** Rates can be changed on this screen to be effective for this batch.
5. Verify the **Order** that products will be added. **Pre-Rinse** time should be set for at least 3 seconds. If these need to be changed, press **EDIT RECIPE.**
6. Verify **Calculation Mode** and Acres, Volume, and Application Rate.
7. Verify that **Prod Volume** and **Total Gallons** for each product appears reasonable for this batch and that there is sufficient product in each tote to complete the batch.
8. Verify that all manual valves are in correct position and that all hoses are connected properly.
9. When all is ready on the **Job Screen**, press **RUN** to return to the RUN SCREEN.
10. Start the pump when ready to run the batch, and then, on the **RUN SCREEN**, press **START.**

QuickDraw Controller

Menu Screen



Menu Screen:

This screen allows access to the different sections of the controller.

RUN: Gives access to the main operational screen that shows live data during batch operation. All of the operational and data management screens are available from here.

JOB SCREEN: Shows the job screen that is used to set up the current job that will be batched out. From here a new recipe can be created or an existing recipe can be loaded and edited.

SETTINGS: Global settings to the controller are changed here.

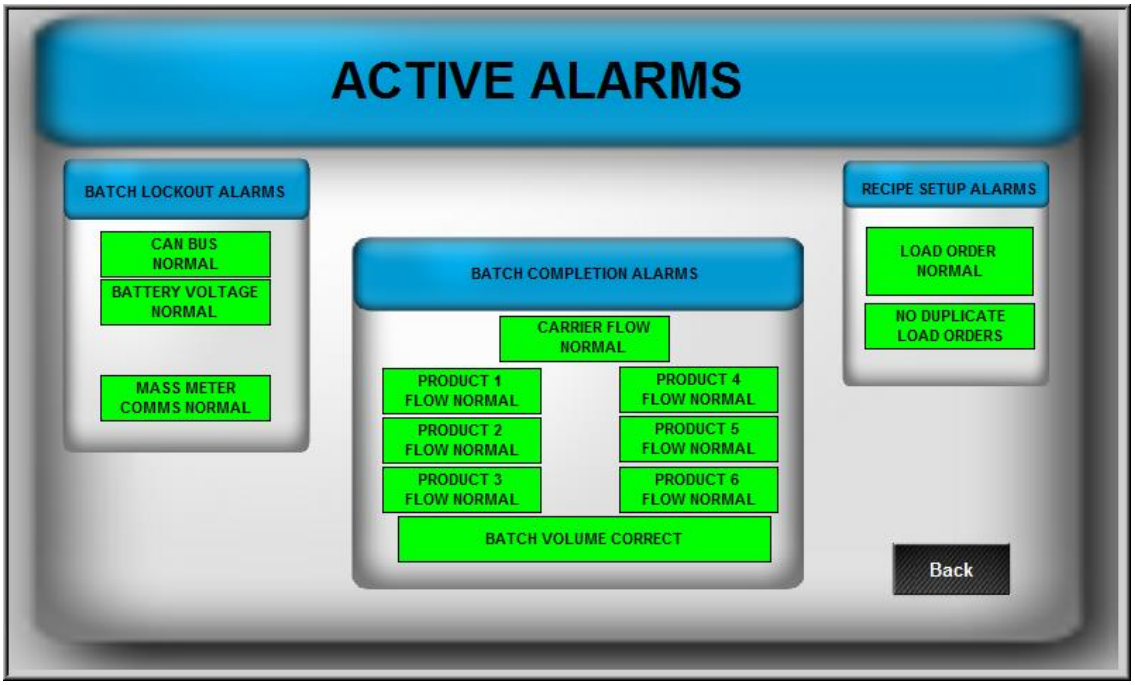
MAINTENANCE : This screen allows access to maintenance items that rarely need accessed.

HISTORY: Allows access to the historical log stored in the controller.

ALARMS: Alarms will prevent a batch from running. Press the **ALARMS** button to go the **ACTIVE ALARMS** screen to resolve the issue to continue running a batch.

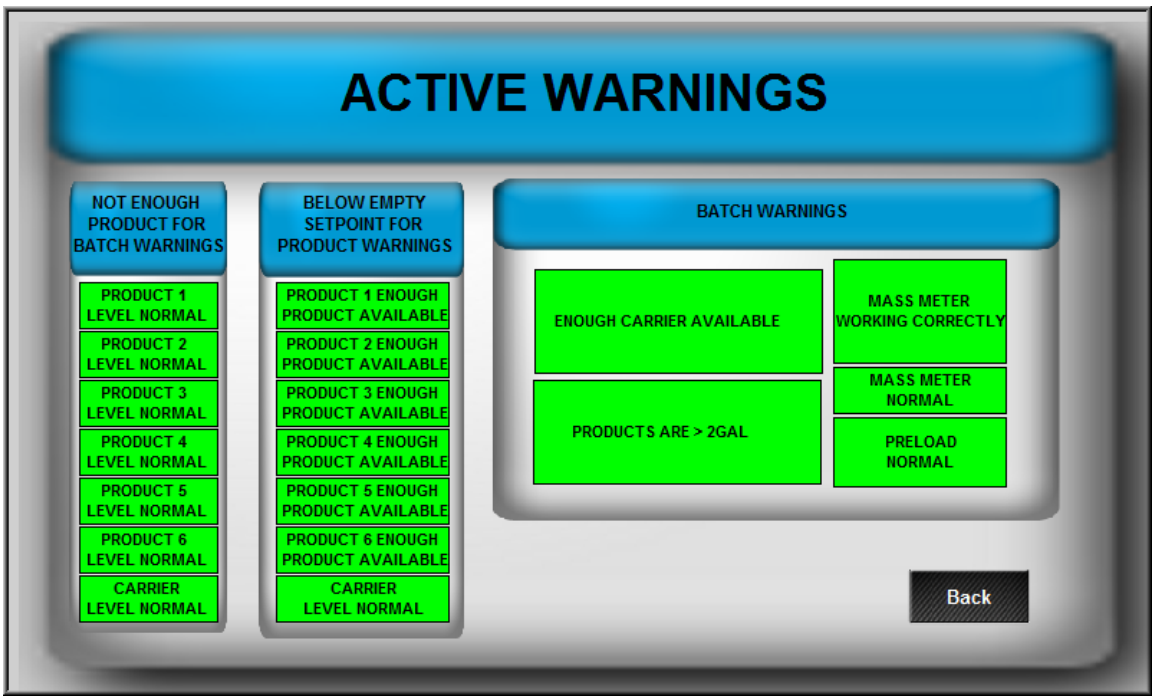
WARNINGS: A batch will continue running with Warnings, but there may be a problem with completing the batch as desired. Press **WARNINGS** to see **ACTIVE WARNINGS** to resolve any issues.

Alarms and Warnings

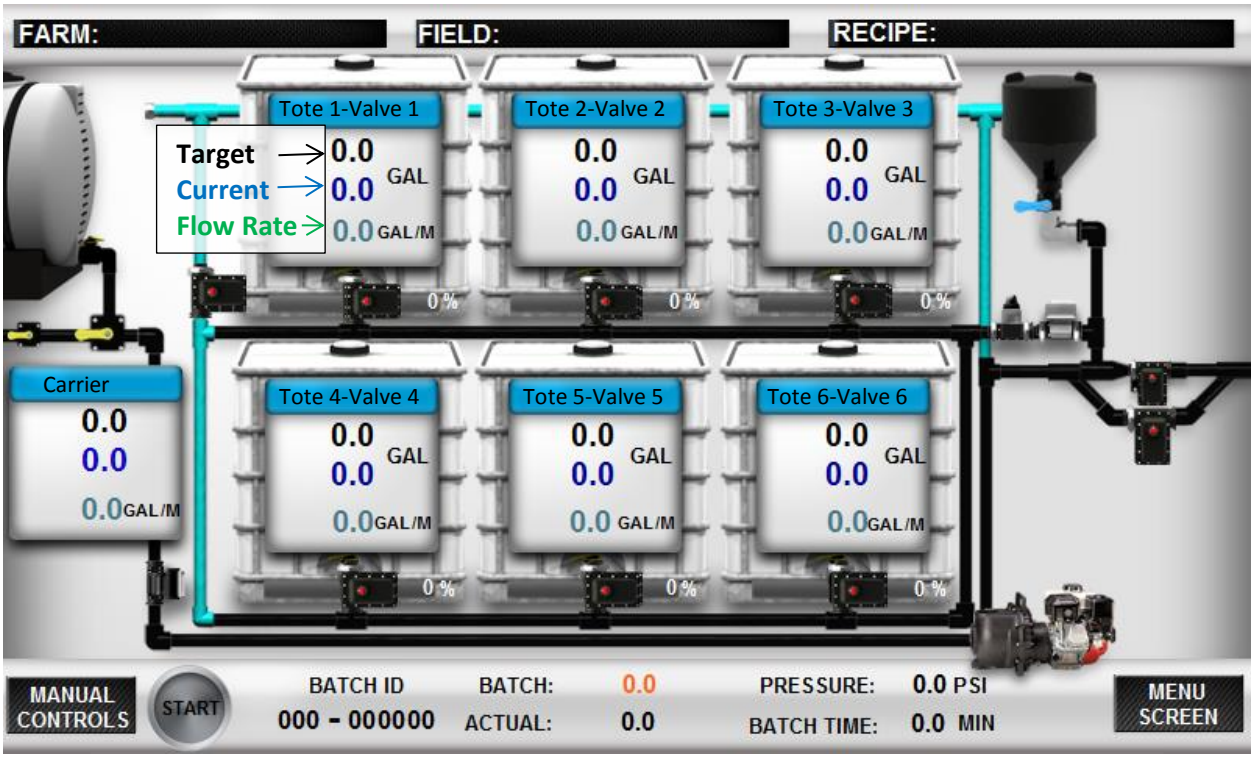


ALARMS will prevent a batch from running and must be resolved before continuing.

WARNINGS will not stop a batch, but should be resolved to prevent a problem.



Run Screen



RUN SCREEN:

This screen contains all of the real-time data that occurs during operation. Each box on the screen represents one of the shuttles or totes that can be hooked up to the system. Each shuttle also corresponds with a specific valve on the QuickDraw box. The numbering of the totes on the screen starts in the top left and ends in the lower right tote on the screen. The corresponding valves on the side of the QuickDraw are 1 to 6 starting from the large valve at the bottom and counting up from there. The seventh tote by itself to the left shows the carrier or mix water flow information. **Press on a tote** to bring up the *TOTE SETUP SCREEN.*

Each tote above has 3 lines of information. The **black number** in each tote contains the **target value** for this batch and is the result of the calculations on the Job Screen. The **blue number** in each tote contains the **current total value** (running total) that has been dispensed for this batch from that tote. This number will increase as the product in that tote is being dispensed. The system will switch to the next product in the sequence once the blue number equals the black number. The **green number** shows the **flow rate** of the product into the mix, so it will show how fast the product is added into the mix. *The units displayed for these three numbers are determined by the "Volume Units" selected for that product on the Recipe screens. So your prescription or rate/acre could be in oz, but if gallons is selected for volume units, it will display in gallons here.*

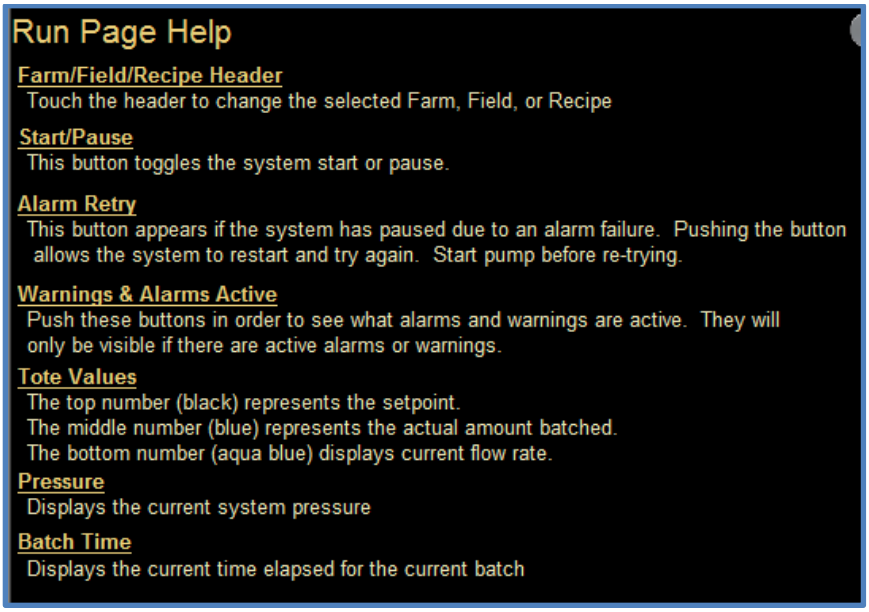
The bottom of the screen contains the information about the entire batch. The **batch id** is a **unique number created for every batch** that can be used to tie this batch with other data that is being used elsewhere. Both sets of data can be correlated by using the batch id. The **orange number** is the **calculated target total batch size** for this batch. This will be the **final batch size** that is loaded. The **black number in the bottom** that has the label **ACTUAL**: will count up as the batch is running and **the batch will complete when it reaches the target**. The pump pressure is shown under **PRESSURE** and is a **monitor-only value** for troubleshooting, but does not have any control of the process. The **BATCH TIME** displays the current time elapsed for the current batch, or if the batch is complete, how long the batch took to complete.

The **START** button is used to initiate a batch. Once initiated, this button changes from START to **PAUSE**. Once the batch is active, pushing the PAUSE will put the process into a paused state. The pump will continue to run but the valves will be closed. Pushing the PAUSE also causes another window to pop up that gives you the choice to **RESUME** or **TERMINATE** the batch. If the batch needs to be terminated, push the TERMINATE button. If the batch needs to continue, then push the RESUME button.

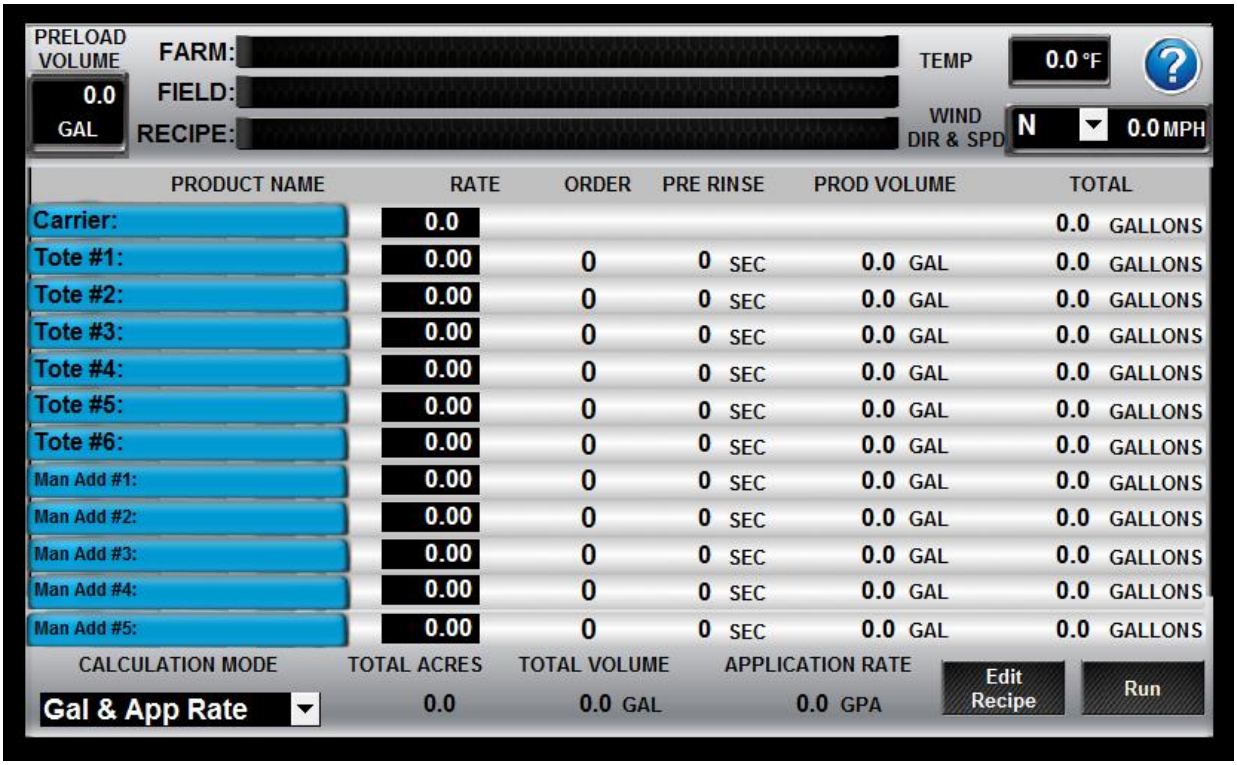
When alarms occur, an **ALARM RETRY** button appears on the lower right corner of the screen. The alarm also puts the process into a pause state and closes all valves and shuts off the pump if the pump supports the auto shutoff. Fix the issue, then start the pump, and push ALARM RETRY to continue the batch. The batch will pick up from where it was and finish the previously started batch. If the alarm continues to happen or you are unable to determine the issue contact SureFire for technical support. The batch can also be terminated from the alarm state by pushing the PAUSE button, and then by pressing TERMINATE.

MANUAL CONTROLS: Press **MANUAL CONTROLS** to go to the *Manual Operation and Debugging Screen.* This is not necessary for normal operation, but may provide useful information for troubleshooting. This is also used for running a manual batch.

MENU SCREEN: Press **MENU SCREEN** to return to the main menu screen.



Job Screen



The **Job Screen** is for setting up and verifying the batch to be run. This screen allows for the selection of a **farm**, a **field**, and a **previously saved recipe or creation of a new recipe**. The **wind speed**, **wind direction**, and **temperature** can also be entered on this screen to be logged with this batch when the batch is completed. Once a batch is completed, all of the information on this screen along with product EPA Registration numbers and actual totals batched for each product are logged to a log file in the controller. This historical information can then be retrieved using the iPad QuickDraw app. Refer to the Wireless Control section of this manual.

Recipes consist of automated bulk products and manually added products. The automated bulk products are the products that are on the trailer in bulk shuttles. These products hook up directly to valves 1-4 or 1-6 depending on the QuickDraw model. The system can pull in bulk products automatically as long as the total amount required for that product for the batch is greater than 2 gallons. Anything that is in powder form or less than the 2-gallon minimum would be considered a manually added product. The process will pause when it gets to these products in the cycle and allow for the operator to use the optional *CLEANLOAD* eductor system available from SureFire or the operator can use the inductor system on their sprayer, if available, to add these products to the batch. Once they have finished adding these products, then they tell the controller how much they actually added and tell the batch to continue to the next product (two taps on the screen will do this). *Do not delay in adding the manual products, as carrier is being pumped at 40 GPM during this time. A delay (especially on a small batch) could result in all of the carrier being pumped before all the chemicals are added.*

The recipe information used to create a batch is as follows.

PRELOAD VOLUME: An amount can be entered here if the operator wishes to preload an amount of the carrier before any product is loaded. A warning will be generated if the preload amount is too large for the batch size.

PRODUCT NAME: The name of the product used in the recipe.

RATE: The application rate/acre of each product. The units are set on the Recipe Screen under Volume Units.

ORDER: This is the order that the products get loaded (as determined by the operator). Products are set up in the recipe based on which valve they are hooked up to (i.e. Product 1 is Valve 1, Product 2 is Valve 2 etc). *Products **do not** have to be loaded in valve order. The load order is set on the Recipe screen by the operator and products can be loaded in any order, regardless of valve number, or regardless of whether it is an Automatic or Manual product.* This allows the recipe to call for a manual product first and then go through the bulk automated products and then back to a manual product again or load them in any order the operator chooses.

PRE-RINSE TIME: This sets the rinse time before this product is batched. For example, if this is set to 3 seconds, the rinse valve will be open for 3 seconds prior to the product valve opening which will rinse the common header for that time period. **The rinse time should be set no lower than 3 seconds**. The process also includes a final post rinse time of 8 seconds that is not changeable. When the last product has been completely batched, the rinse valve will remain open for 8 seconds to make sure all products are rinsed out of the system.

PRODUCT VOLUME: This column displays the amount of product necessary in the selected totalizer units for that product. This is calculated by taking the number of acres times the rate entered and then converting from the rate units to the totalizer units. For example, if the rate is 32 Oz/Acre, the batch size is 100 Acres, and the totalizing units for the product is in pints, then the product volume is 32(oz/acre) * 100(acre) / (16 oz/pt) = 200 pts

TOTAL: This column shows the total amount needed for this batch for this product in the total batch units (either gal or liters). For example, if we take the 200 pts from the example in PRODUCT VOLUME and convert it to GAL, then the total will read 25 GAL.

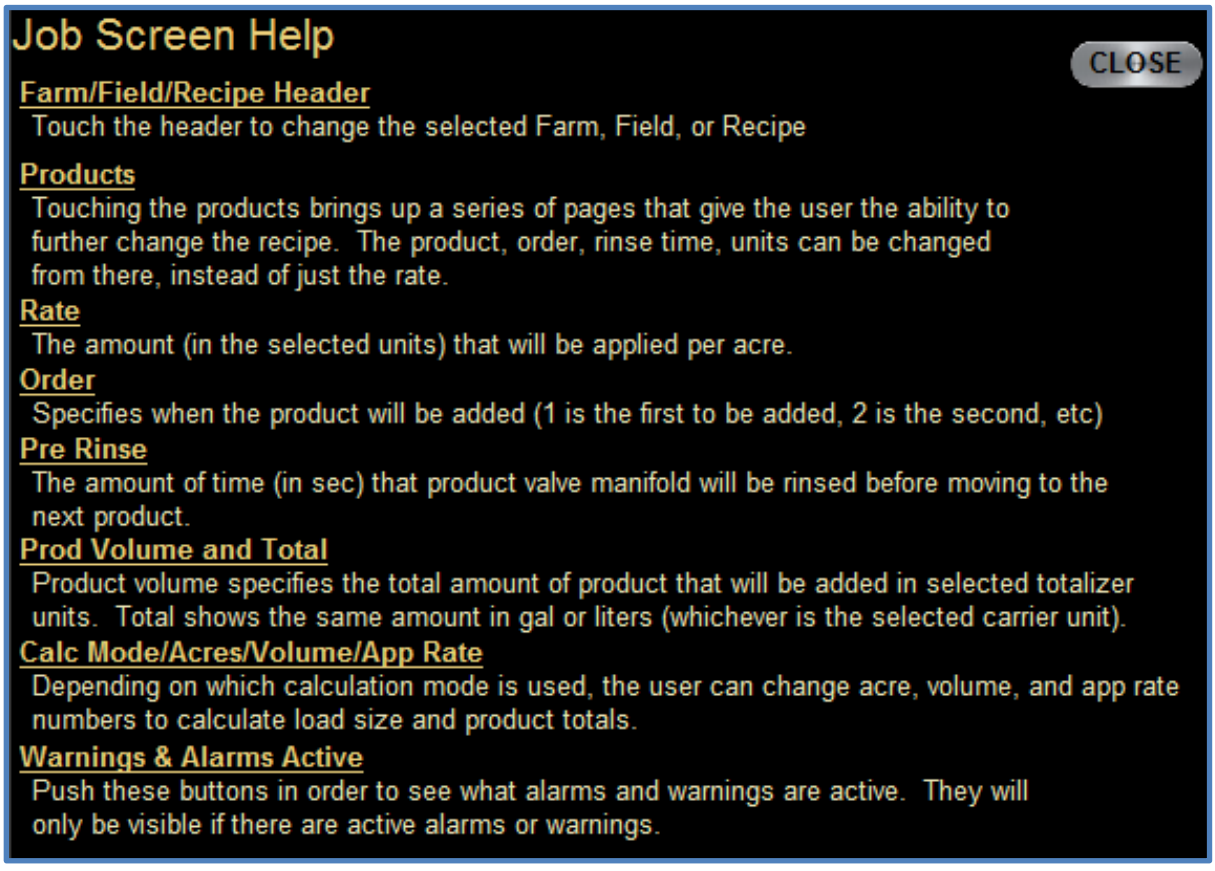
Calculation Mode: The information at the bottom of the screen is used to calculate the size of the batch from the recipe that was loaded. There are 4 different ways to calculate batches that can be chosen from the drop down menu, and they are as follows.

1. **Gallons and Application Rate**: This setting will be used when filling the sprayer tank full. This uses the **gallons** box and the **application rate** box to come up with the number of acres needed for this batch. Then all of the product amounts are calculated. From this information, the carrier amount is determined by subtracting all of the product amounts from the total gallons.

2. **Acres and Application Rate**: Use this mode when spraying a known area requiring less than a full sprayer tank.This uses the **acres** box and the **application rate** box to calculate how many gallons of product are necessary. Then the number of acres is used to calculate how much of each product is needed for this batch. From this information, the carrier amount is determined by subtracting all of the product amounts from the total gallons.
3. **Volume**: This method does no math. The total amount that needs batched is entered into the column where the rate is normally entered. This amount is entered in the units set up by the Total column. The batch will still be automatically batched out, but the controller does no math on the batch.
4. **Acres and Carrier Rate**: This uses the **carrier rate** box and the **acres** box. This mode is used if you want to specify how much carrier is going to be applied per acre instead of specifying the overall application rate. The application rate that gets entered into the sprayer is calculated in this case instead of set.

Edit Recipe: The only things that can be changed on the Job Screen are the items in the black boxes. Rate, Calculation Mode, and Calculation Variables (acres, application rate, total gallons) can be changed on the Job Screen. To change other variables, press **EDIT RECIPE**. Changes made on the Job Screen apply only to the current job, and are not permanent changes to the recipe. Permanent changes to the recipe must be made at the EDIT RECIPE screen and saved by pressing SAVE RECIPE.

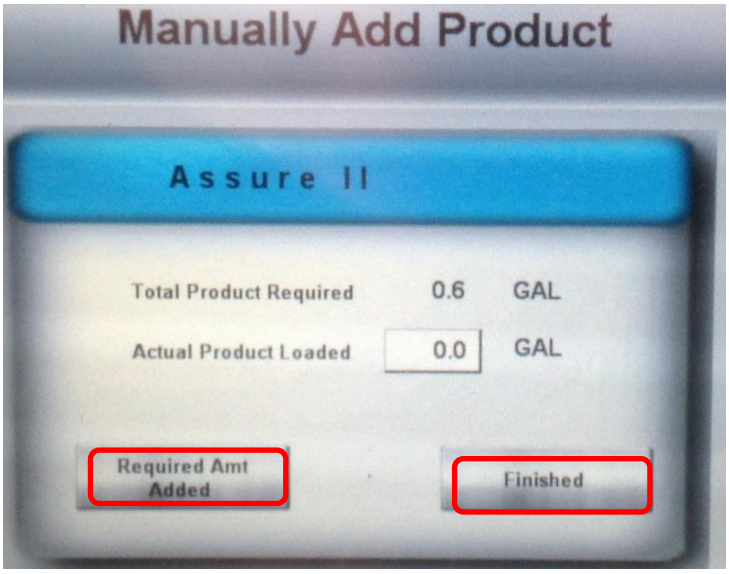
Run: Returns user to the RUN screen (does not start the batch).



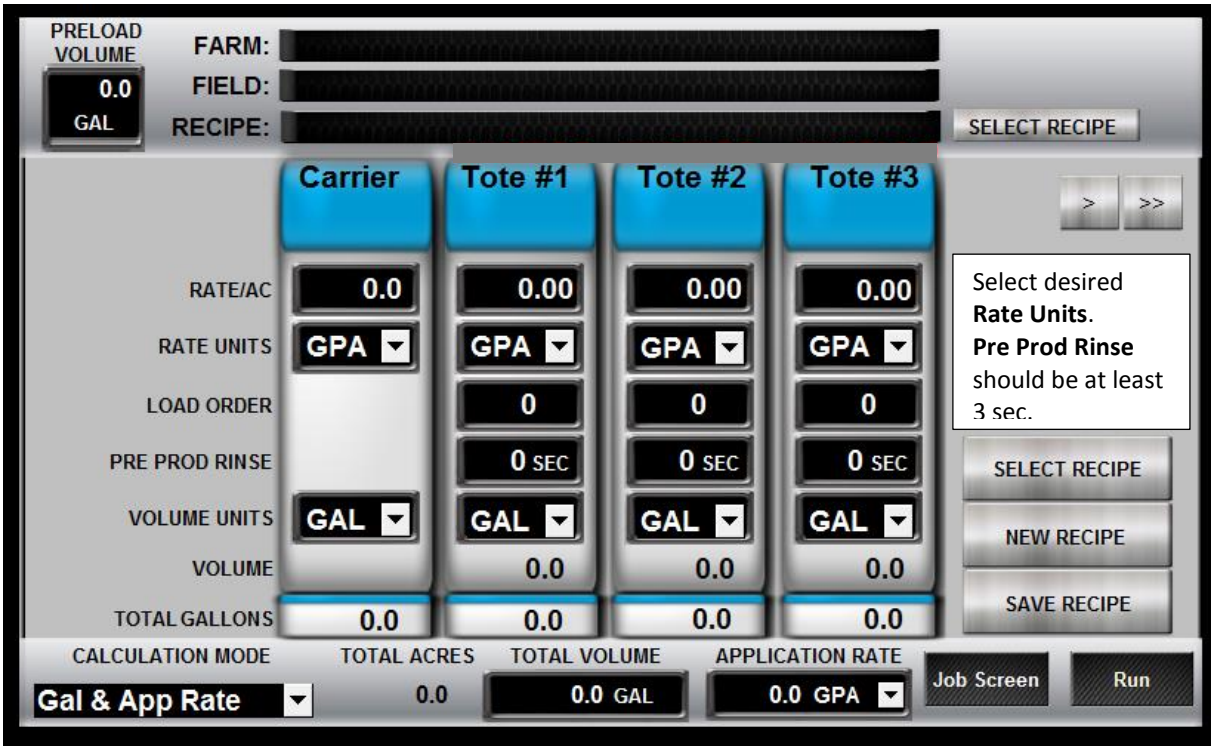
Manual Products

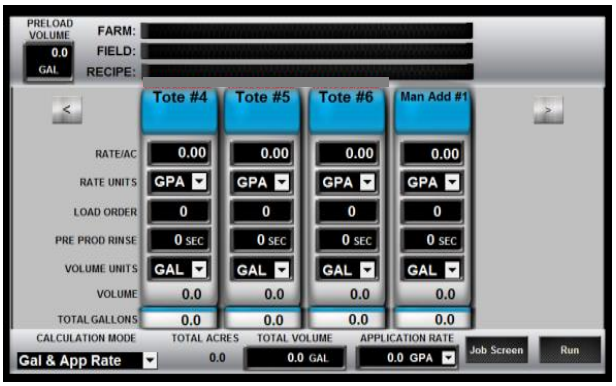
Manual Products are products in a batch that are **not** added through one of the automatic valves. These products are added through the optional CleanLoad eductor that is available with the QuickDraw or through the sprayer's inductor or that are added directly to the sprayer tank. Manual products are included in the recipe and appear in the historical batch record. Manual products may be dry or powder products, or they may be liquid products that do not come in bulk containers or that will have less than 2 gallons in a particular batch. (Liquid products that are in a tote connected to one of the valves, but which are scheduled to have less than 2 gallons in a particular batch, may be run through the automatic product part of the recipe, but it is recommended they be added as a manual product.)

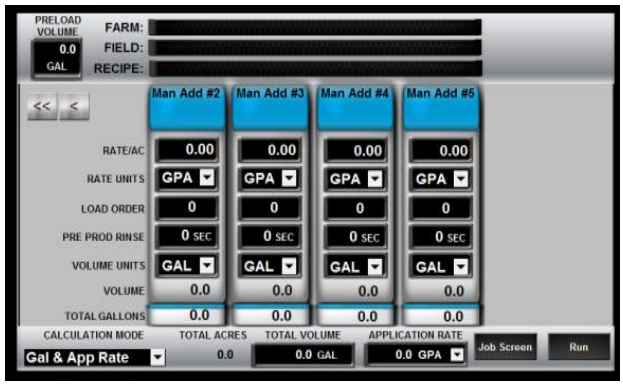
As the recipe is put together, the **Order** of the manual product(s) is entered. The manual product(s) can be set up to load in whatever order the operator desires. When the batch is being run, the following message will appear on the controller screen and on the iPad QuickDraw App. **The carrier will continue to be pumped at 40 GPM while the manual product is added**. The QuickDraw will continue to complete the batch after the operator presses **Required Amt Added** (or enters something else in the *Actual Product Loaded* box) and presses **Finished**. (If, for some reason, there is going to be a substantial delay in adding the manual product, the user should press those 2 buttons and then press **PAUSE** on the Run Screen to stop the carrier flow until the manual product can be added. Then, the batch can be RESUMED.)



Edit Recipe Screens







These are the **EDIT RECIPE** screens. All of the same information that was on the job screen above shows up on this screen also, though everything on this screen can be edited. A recipe can be edited on these screens and those changes are active for the recipe until a recipe is loaded, but those changes are not saved permanently unless the "**SAVE RECIPE**" button is pressed. Each column represents one product and the settings that are necessary to batch that particular product. The settings are used as follows.

Blue portion of product box displays the **Tote Number and product name**. Pressing this part of the product column allows selection of a new or different product. Press the arrow to the left or right of the blue boxes to move to a screen showing the other totes or manual products.

PRELOAD VOLUME: An amount can be entered here if the operator wishes to preload an amount of the carrier before any product is loaded. A warning will be generated if the preload amount is too large for the batch size.

RATE: The application rate/acre of each product.

RATE UNITS: The units the rate above is entered in. . Options available are: GPA, OZ/AC, PT/AC, QT/AC, LBS/AC dry OZ/AC dry, L/AC, mL/AC, or Pt/100, Qt/100, Gal/100 or lbs/100. (lbs/100 is for a product that will be added as lbs of product per 100 gallons (liters) of mix.)

LOAD ORDER: This is the order that the products get loaded (as determined by the operator). Products are set up in the recipe based on which valve they are hooked up to (i.e. Product 1 is Valve 1, Product 2 is Valve 2 etc). *Products **do not** have to be loaded in valve order. The load order is set here by the operator. Products can be loaded in any order, regardless of valve number, or regardless of whether it is an Automatic or Manual product.* This allows the recipe to call for a manual product first and then go through the bulk automated products and then back to a manual product again or load them in any order the operator selects here.

PRE PROD RINSE: This sets the rinse time before this product is batched. For example, if this is set to 3 seconds, the rinse valve will be open for 3 seconds prior to the product valve opening which will rinse the common header for that time period. **It is recommended that the rinse time be set no lower than 3 seconds.** The process also includes a post rinse time of 8 seconds that is not changeable. When the last product has been completely batched, then the rinse valve will remain open for 8 seconds to make sure all products are rinsed out of the system.

VOLUME UNITS: These are the units that will be used for the VOLUME row. The controller will only allow selection of units that make sense with previous selections. These units will be used in the Historical Log for this batch.

VOLUME: This row displays the amount of product necessary in the selected totalizer units for that product. This is calculated by taking the number of acres * rate entered and then converting from the rate units to the totalizer units. For example, if the rate is 32 Oz/Acre, the batch size is 100 Acres, and the totalizing units for the product is in pints, then the product volume is 32(oz/acre) * 100(acre) / (16 oz/pt) = 200 pts

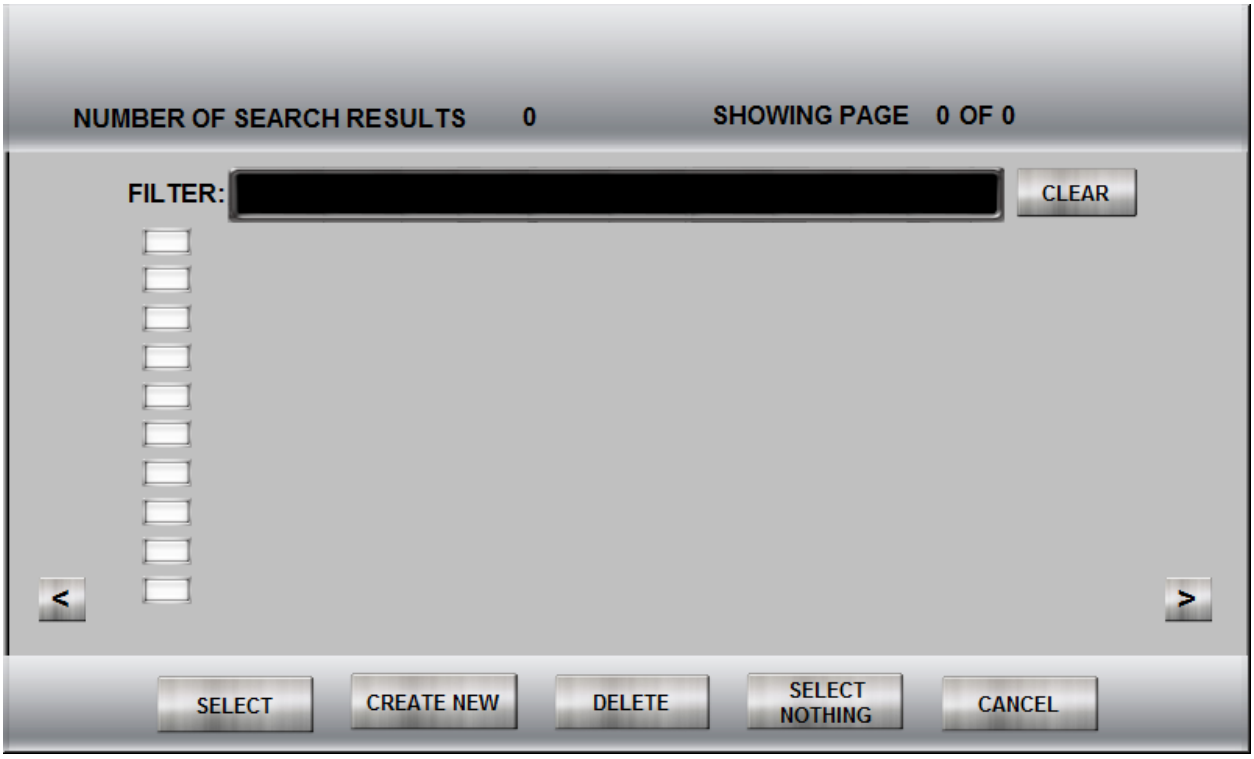
TOTAL GALLONS: This column shows the total amount needed for this batch for this product in the total batch units (either gal or liters). For example, if we take the 200 pts from the example in PRODUCT VOLUME and convert it to GAL, then the total will read 25 GAL.

Example of figuring how much product is used when rate is **lbs/100 gal**.

Using 15 lbs of product per 100 gal of batch mix, and making a 600 gallon batch.

$$\frac{15 \text{ lb}}{100 \text{ gal}} \times 600 \text{ gal} = (15 \times 600) / 100 = \textbf{90 lbs} \text{ of product}$$

Farm and Field Selection Search Screen



This screen is brought up by clicking on Farm or Field in the Recipe, Job, or Run screens. Typing in the filter box brings up a “starts with” type search and displays only those farms or fields to narrow the search. Selected Farm and Field are saved with the Batch information in the history file.

Press on the button beside the Farm or Field name to highlight that Farm or Field. Push SELECT to use that Farm or Field.

Push CREATE NEW to create a new Farm or Field.

Push EDIT to edit an existing highlighted Farm or Field

DELETE will delete the highlighted Farm or Field.

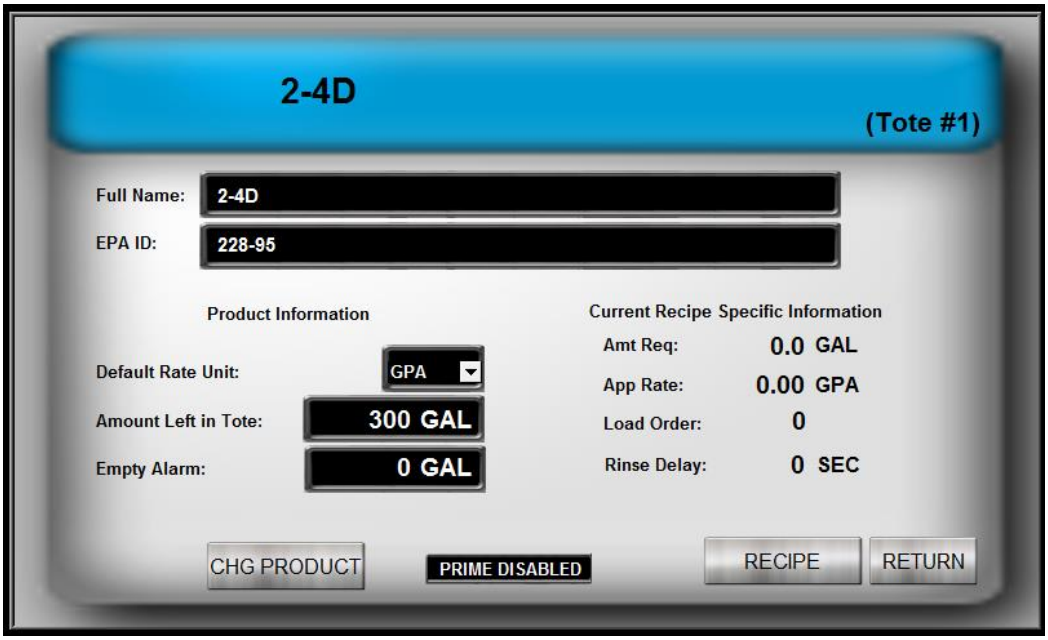
CANCEL returns to the previous screen with no action being taken.

Farm and Field information are not saved with Recipes. Farm and Field information is saved in the historical record with each batch that is run.

Load Recipe Selection Screen

This screen is brought up by clicking the Recipe name in the Job Screen or by selecting Change Recipe on the Recipe Screen. Typing in the filter box brings up a “starts with” type search and displays only those recipes to narrow the search. The controller will store up to 255 recipes. If more recipes are added, the first recipes that were saved will be overwritten.

Tote Setup Screen



This screen is the **TOTE SETUP** screen. Get to this screen by pressing on one of the totes on the Run Screen. This gives the ability to manage what product is in a specific tote. The product shown for each tote is the same as what gets set up for that product in a recipe. This is where product-specific information can be edited. Changes made here to Name, EPA ID, Custom Cal Number, and Rate Unit will change the Product defaults.

Update the Amount Left in Tote when a tote is first connected or refilled so the QuickDraw will know if there is enough product to complete a batch. Check here as batches are run, to verify that the amount shown here matches what is left in the tote.

The available information is as follows.

FULL NAME: This contains the name for this particular product.

EPA ID: This contains the EPA registration number for the specific product. The iPad app that can be used with the controller makes the management of this information easy.

RATE UNIT: The desired rate unit can be selected here. Options available are: GPA, OZ/AC, PT/AC, QT/AC, LBS/AC dry OZ/AC dry, L/AC, mL/AC, or Pt/100, Qt/100, Gal/100 or lbs/100. (lbs/100 is for a product that will be added as lbs of product per 100 gallons (liters) of mix.)

AMOUNT LEFT IN TOTE: This is a running total of how much product is left in this tote. *This value needs updated when a new shuttle is placed on the trailer, or when the tank that is used is filled*. Then as batches are run, this value will decrease for the batch amount. If the amount needed for a batch is higher than the value in this box, then a **NOT ENOUGH PRODUCT TO COMPLETE BATCH** warning will be displayed. The Shuttle Inventory Alarms can be DISABLED on the SYSTEM SETTINGS screen.

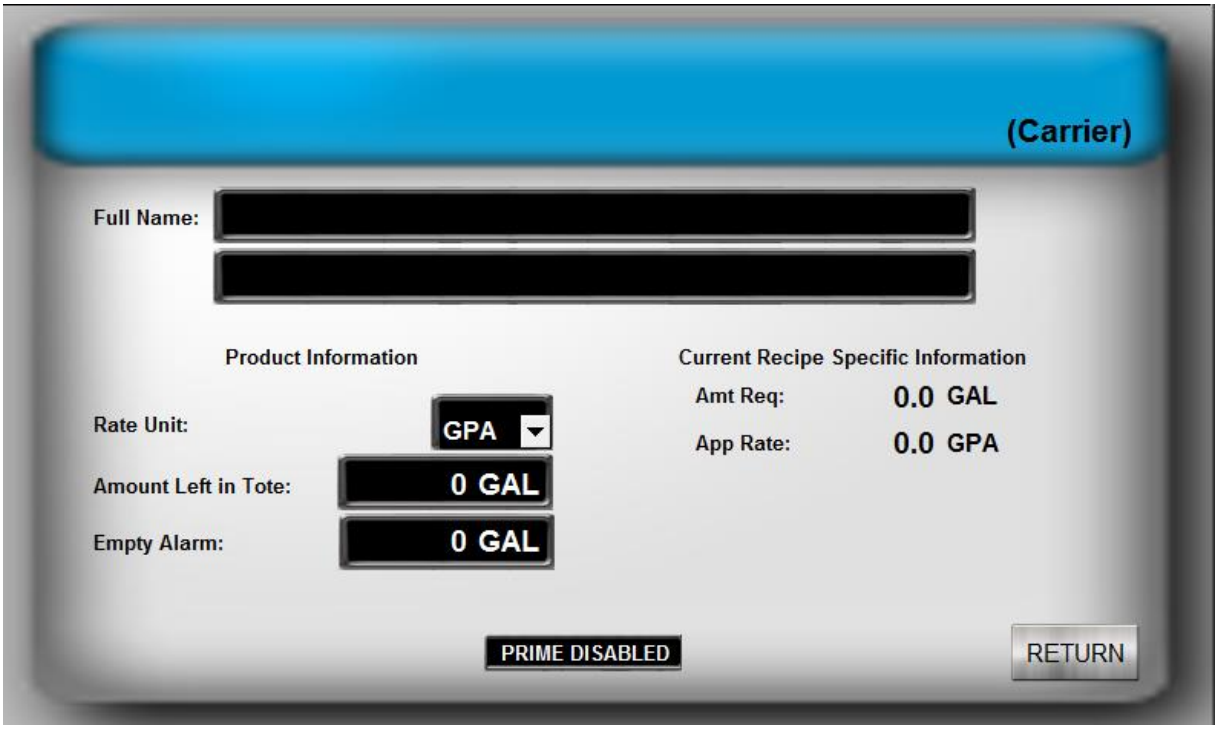
EMPTY ALARM: If this value is greater than zero, a **PRODUCT LOW** warning will show when the Amount Left in Tote number gets below this value. If this is left at 0, no EMPTY message will be displayed. The Shuttle Inventory Alarms can be DISABLED on the SYSTEM SETTINGS screen.

The product can be changed by using the **CHG PRODUCT** button.

Prime Disabled/Enabled: Press on this button to toggle between Prime Disabled and Prime Enabled. The default setting is Prime Disabled**. This should be switched to PRIME ENABLED when a new tote is first used or when a tote has run empty.** This will allow the system to run longer (to prime) before timing out for a No Flow condition. PRIME ENABLED will automatically switch back to PRIME DISABLED after the batch is run.

The other information on the screen is informational and related to the current recipe.

Carrier Setup Screen



Full Name: Enter the name for the Carrier. This will appear on the Run screen and in the historical files.

Rate Unit: The desired rate unit can be selected here. This can be set to GPA or L/AC.

Amount Left in Tote: This is a running total of how much carrier is left in the supply tote. *This value needs to be updated when the carrier tank is filled.* Then as batches are run, this value will decrease for the batch amount. If the amount needed for a batch is higher than the value in this box, then a **NOT ENOUGH PRODUCT TO COMPLETE BATCH** warning will be displayed.

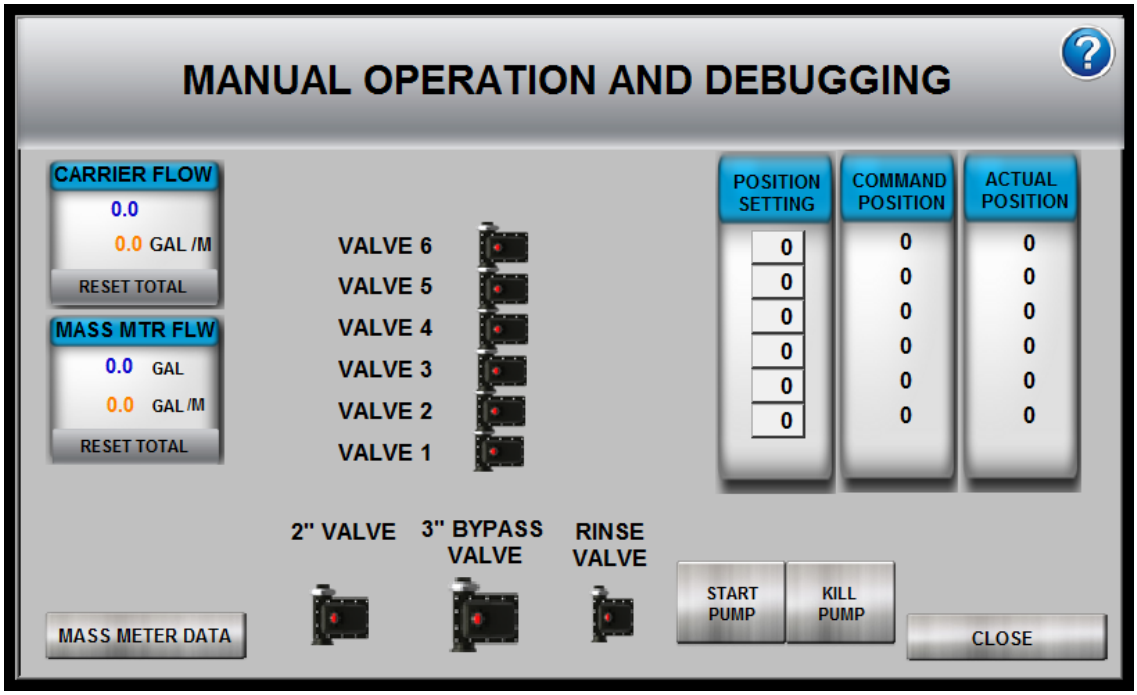
Empty Alarm: If a value greater than 0 is entered here, a **CARRIER NEEDS REFILLED** warning will be displayed when the amount left in the carrier supply tank drops below this value. If this value is left at 0, no Carrier Empty alarm will be displayed.

Prime Disabled/Enabled: Press on this button to toggle between Prime Disabled and Prime Enabled. The default setting is Prime Disabled. This should be switched to **PRIME ENABLED** when a new tote is first used or when a tote or carrier supply tank has run empty. This will allow the system to run longer (to prime) before timing out for a No Flow condition. PRIME ENABLED will automatically switch back to PRIME DISABLED after the batch is run.

RETURN: Goes back to the RUN screen.


SureFire
QuickDraw
SPRAY TENDER SYSTEM

Manual Operation and Debugging



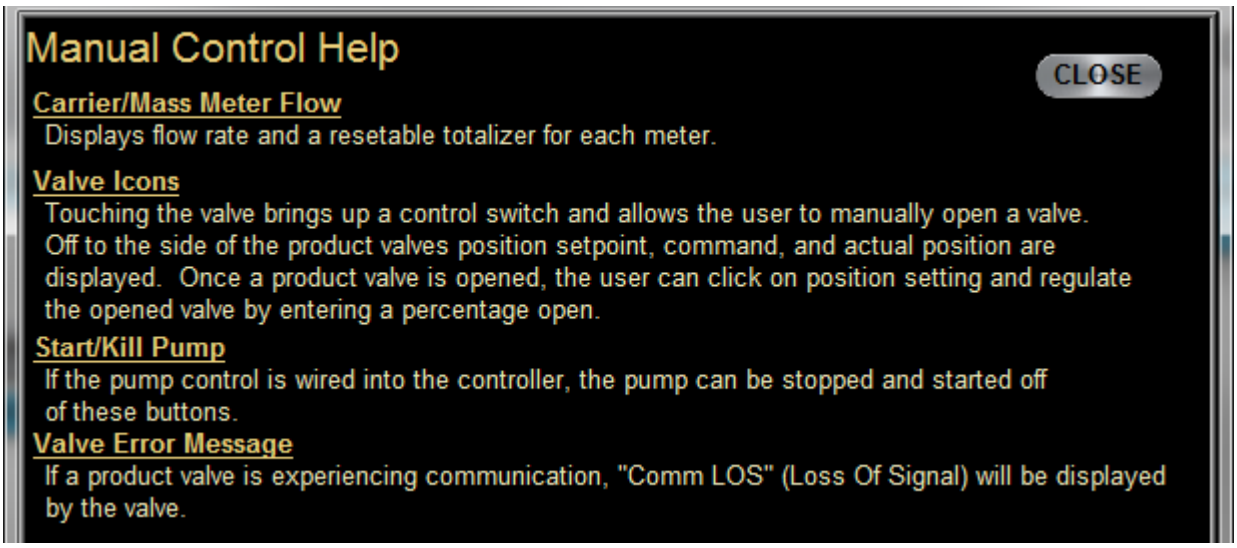
This is the **Manual Operation and Debugging** screen. This screen is useful for checking valves that may or may not be working, double checking valve addressing, and for running a manual batch. Anything that gets run manually does not get logged because the controller has no idea what products or amounts are being introduced into the system, but **a fully manual batch can be run using this screen**. *NOTE: Care must be taken when using this screen even during a batch, because any changes to these settings during a batch will affect the batch.*

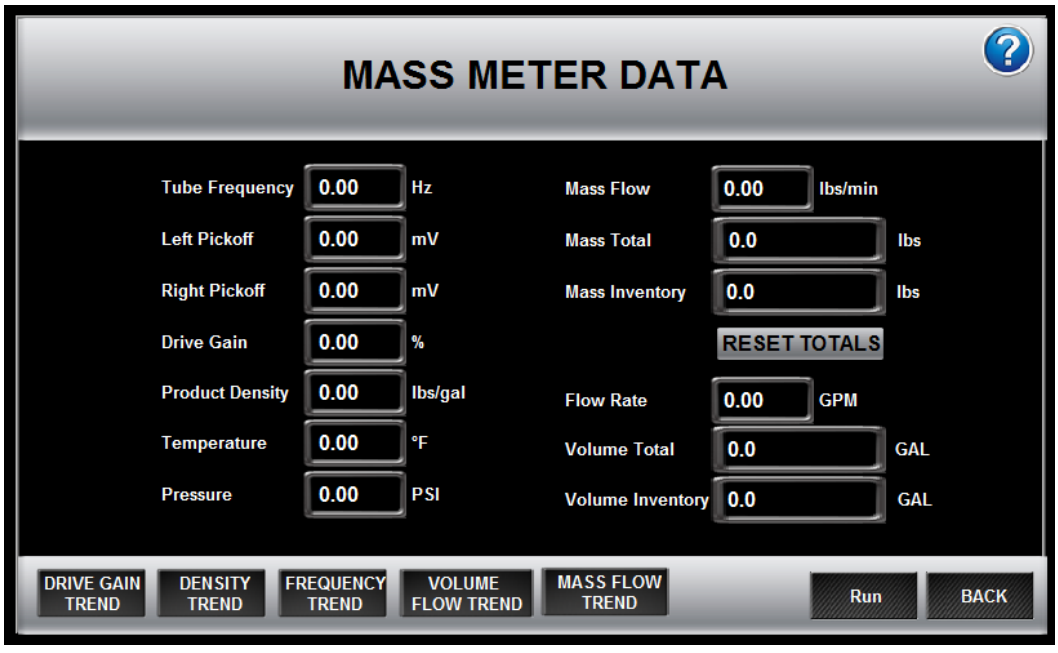
First, the **valve stack** is shown to give indication of the status of each valve. Pressing on a valve brings up a switch that can be used to turn on that valve. Switching the popup to **ON** will cause the valve to open to 100%, and switching the popup to **OFF** will set the percentage to 0% and close the valve. The position setting column can be used to adjust the position of the valve. To adjust the position, first click on the valve number you want to adjust, then turn on the valve, and finally set the valve position box to the desired position. The **COMMAND POSITION** will show the value being sent to the valve. During a batch these will update automatically. The **ACTUAL POSITION** column shows the position that the valve communicates back to the controller. All three columns should read about the same number once the valve has stopped moving. Note that the command position can be set after the valve has been turned on with the popup.

Second, the left hand side of the screen shows the **flow information**. These boxes show the flow rate and total information for each flowmeter. Each meter also has a manual **RESET** button so that you can reset the value as needed and see your own flow total. *These totals will always use the system CAL numbers for their calculations.*

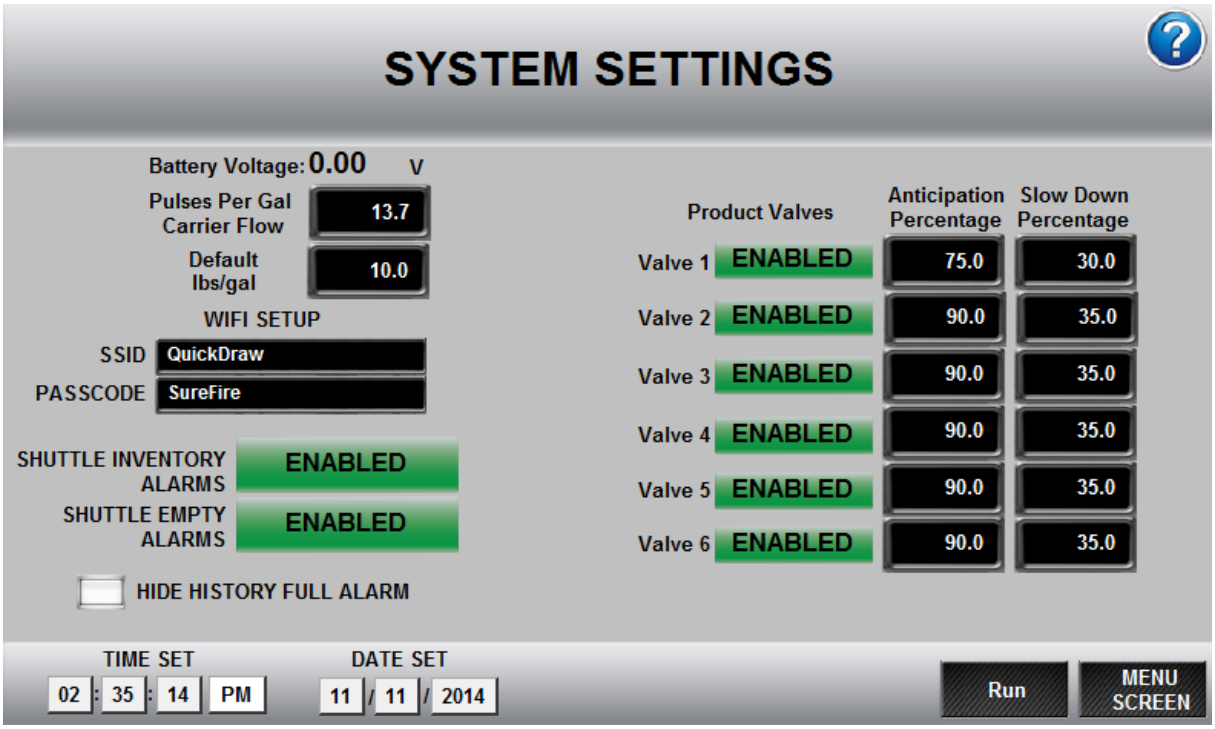
The **Mass Meter Data** button in the lower left corner will take you to in-depth data regarding the mass meter (see picture below). This information may be helpful to Tech Support.

Finally, the bottom of the screen has the control for the **2" Venturi Valve**, the **3" Bypass Valve** and the **1" Rinse Valve**. Pressing the respective valve will pop up the switch window that can be used to manually open and close that valve. There is also a **KILL PUMP** button that will shut down the pump if you have the harnessing and wiring done to enable the pump kill feature. Pressing the **START PUMP** will start the pump if the system is wired for remote starting (*for use with electric motor drive pumps only*).





System Settings



This screen contains the global settings for QuickDraw. The settings are as follows.

Battery Voltage shows the power supply voltage to the controller. Voltage less than 10 V will cause problems for the controller. An alarm will appear and the batch will not run.

Pulses Per Gal Carrier Flow should be set at 13.7 unless usage indicates a change.

Default lbs/gal should be set at 10.0. This is used to convert dry ingredients that are added to the mix to gallons for a batch volume measurement.

The bottom line contains the **TIME SET** and **DATE SET.** This can be used to set the time and date for the unit. This is the time and date that will be used in the log file for historical reporting of batches.

On the left side of the screen is the **WIFI Setup**. This can be used to customize the SSID and passcode for your QuickDraw. This (SSID) is the Network to which your iPad will connect, and the Password it will need to connect. If using two or more QuickDraws in the same immediate area, they may each need to have a unique SSID.

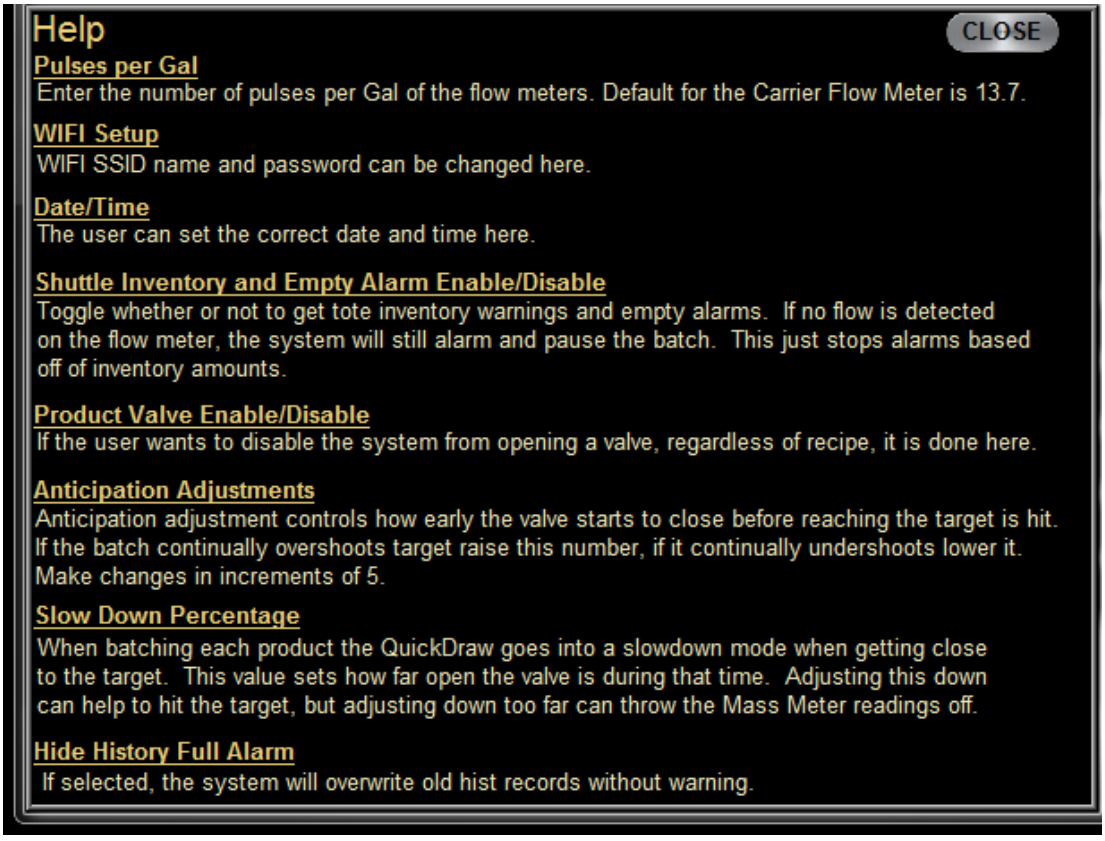
The lower left side of the screen contains the **WARNING ENABLE** features for shuttles. Enabling the **Shuttle Inventory Alarm** causes the controller to show a warning when the level of the shuttle or bulk container gets below what is required for a batch. The **Shuttle Empty Alarm**, when enabled, will show a warning when the shuttle or bulk storage level drops below the empty warning level which is operator settable on the Tote Screen.

The **Anticipation Percentage** lets the operator set how far in advance to start closing the valve to try to hit the target amount. This number can be viewed as a percentage. If it is set to 90, then the valve starts to shut 10% earlier than it would have at a setting of 100. At 110, the valve will start to shut 10% later than it would have at 100. This number applies to the internal algorithm to decide when to close the valve and does not directly correlate to the target amount, though it is affected by the target amount. Raise this number by 2 if the system consistently undershoots the target on this valve. Lower this number by 2 if the system consistently overshoots the target on this valve. Valve 1 default setting is 75. The other valves are set at 90.

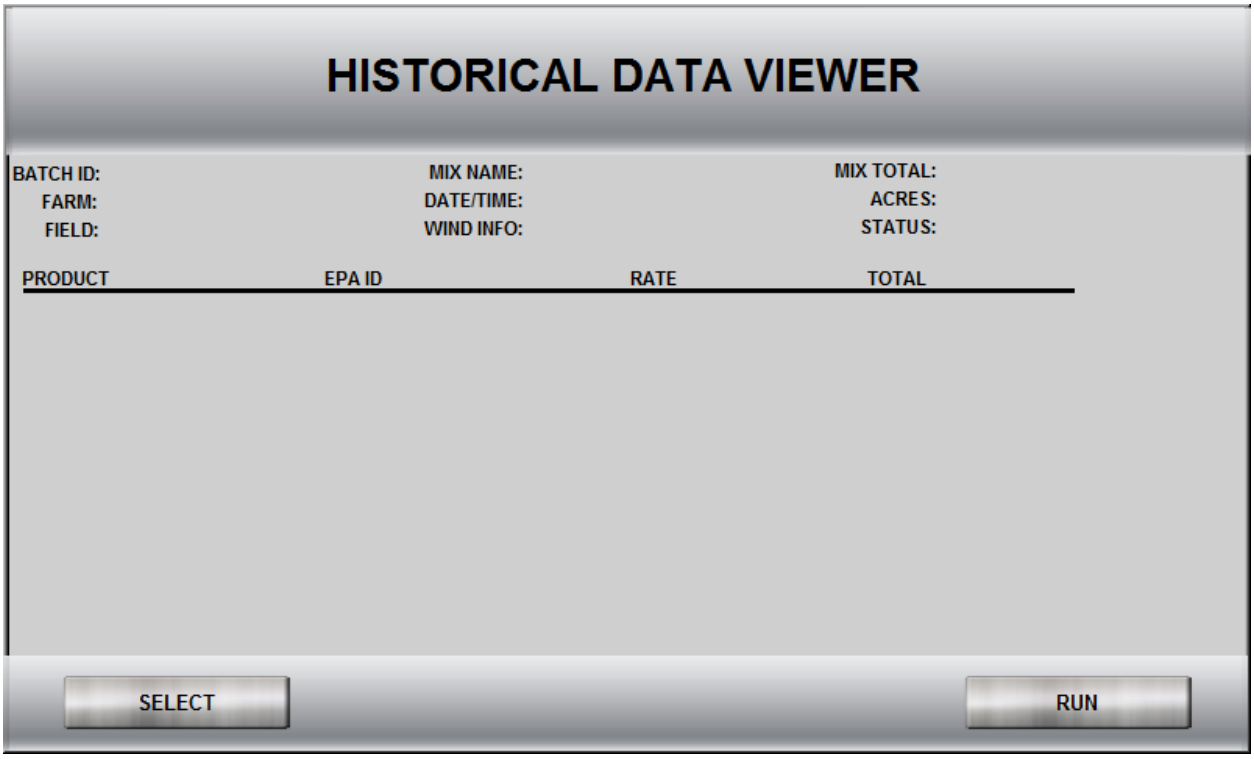
Slow Down Percentage tells the valve what position to go to when it gets close to the Target. Making this number too small can throw off the accuracy of the mass meter. Valve 1 default is 30. The other valves are 35.

The final piece of this system settings screen is the **Valve Enable/Disable**. Here, the **Product Valves** can be **ENABLED** or **DISABLED.** These are used if there is a problem with a valve and the system needs to be able to run batches without that valve. Disabling the valve removes it and the product attached to it from availability for batches.

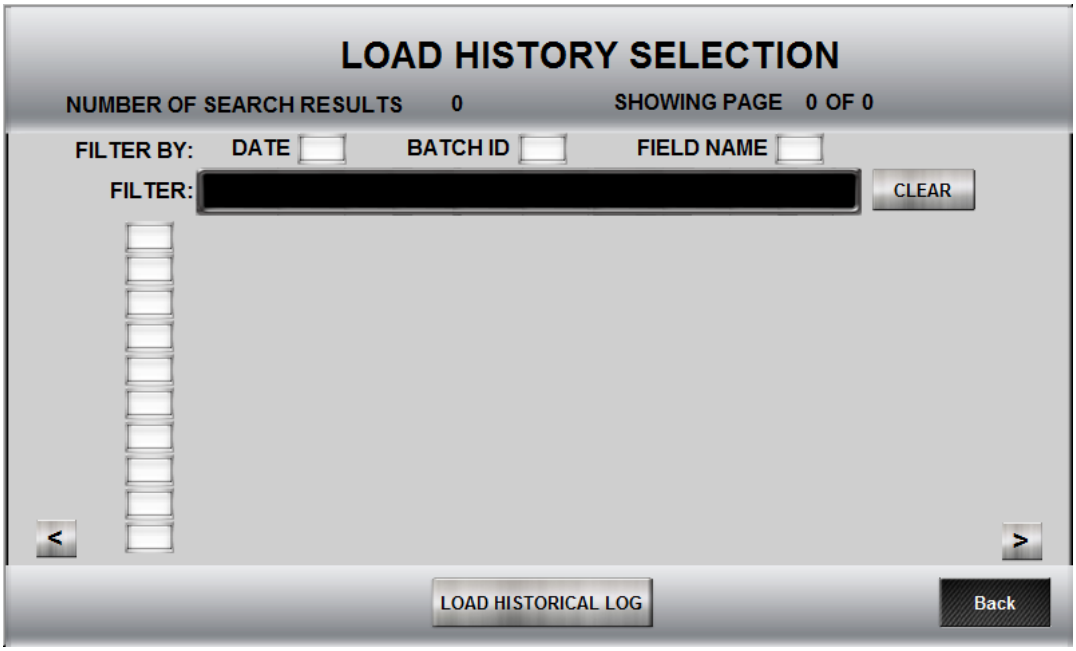
Hide History Full Alarm The history is set up with a FIFO (first in, first out) buffer. When the buffer of 255 batches fills up, the first batch will be overwritten if a 256th record is added. An alarm alerts the user when the buffer is full (so the user can record the info manually or retrieve the history with the iPad before the next batch overwrites the info). If this box is checked, the system will not alarm the user. When the history is downloaded to the iPad (if successful), the controller will clear the buffer.



Historical Data Screen

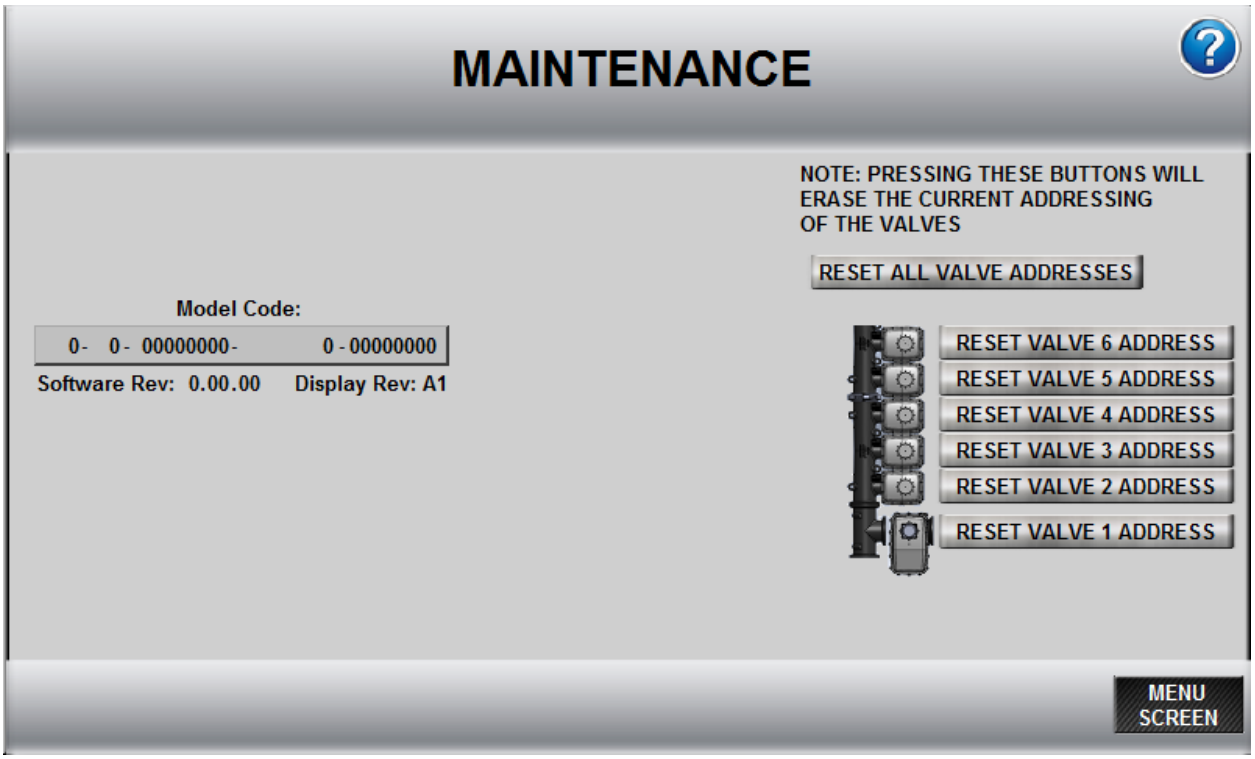


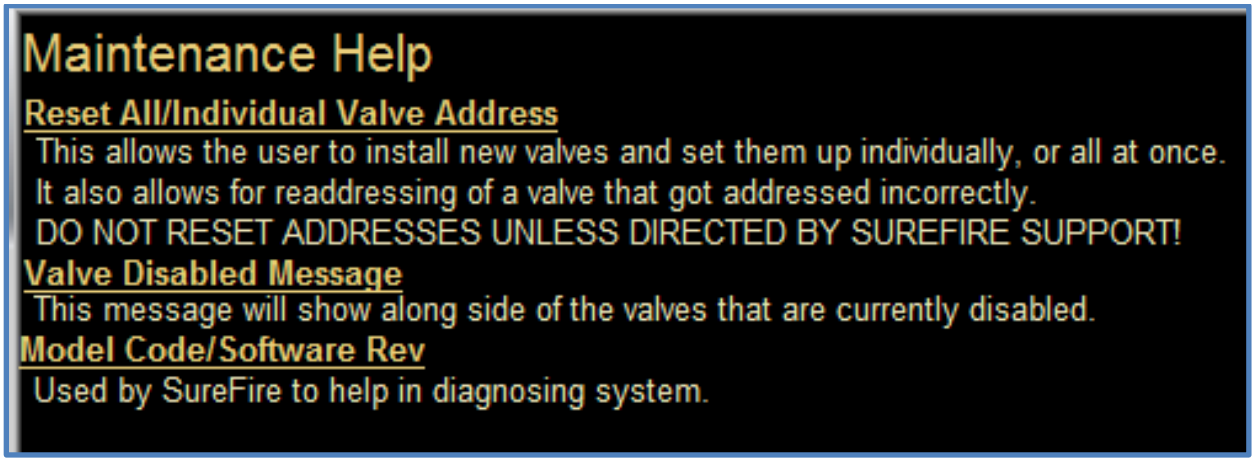
This is the **HISTORICAL DATA** screen. This screen is used to look at the logged batches that are still stored in the controller. *Once the historical data is uploaded to the iPad app, the data is no longer available on the controller.* Use the **SELECT** button to bring up the **Historical Filter** screen. Historical data can be searched by **date** (yyyy-mm-dd), **batch id** (xxx-mmddyy), or **field name**.



Maintenance Screen

DO NOT RESET VALVE ADDRESSES UNLESS DIRECTED BY SUREFIRE SUPPORT!





Maintenance and Troubleshooting

Valve troubleshooting: If valve shows communication fail or "**COMM FAIL** check the following. First, make sure it is connected to the wiring harness and that there are no obvious problems with the connector on the harness or on the valve. Second, go to the Manual Controls section from the run screen. Use the controls there to try to control the valve. If the valve is still not functional, then try unplugging another valve and plug the valve that is not working into that connector. If the valve works then the valve is ok, but something is wrong with the harness. If the valve is still not functional, most likely the valve has an issue and needs to be replaced.

Valve replacement: First, make sure all of the valves are enabled on the system settings screen. Plug in the new valve. Once the new valve is detected the QuickDraw controller screen should change to a **Valve Commission** screen. If the valve number shown on this screen matches the valve that is missing, then hit **CONTINUE** to address the new valve. If it is not, then enter the correct valve number and press CONTINUE. This will configure the valve to the correct valve number. After configuring a new valve, go to the **Manual Controls** screen from the **Run** screen and make sure all valves are operating and that they are operating in the correct position. Make sure that valve 1 is 1 and 2 is 2 and so forth.

Flowmeter troubleshooting: Leaks on the suction side of the system may introduce air into the system which causes the carrier flowmeter to jump around, show empty pipe, or sometimes to show extremely high values. The display will probably show *Carrier Flow Fail* in this case. Look at the carrier flowmeter LCD screen to help see what is happening. If values are highly erratic or zero when the pump is pumping, air leak upstream may be an issue. The same can be said for the product flowmeters as well, but the user will need to look at the flow rate on the controller screen, as there is no readout directly on the product meter.

Air leaks on the suction side of the system will cause erratic flowmeter operation. Air leaks may also create problems with the pump being able to prime. The QuickDraw unit is checked for air leaks at the factory before shipping. The user needs to check all field-connected fittings from the totes or shuttles to insure there are no air leaks in those lines.

Mass Meter Troubleshooting

Communication Issues:

If the controller says **Mass Meter Comm fail**, then the controller is not able to talk to the mass meter.

1. Open fiberglass box on left wall of QuickDraw enclosure
    a. Are all the wires connected? If not, contact SureFire for help.
    b. Is the red light on? If it is then power is good to the communication module in the fiberglass box. If not, check that the wire from the fiberglass box is plugged into the QuickDraw harness correctly.
    c. If the red light is on, connect a voltmeter to the black and red wires top and bottom. It should read 24VDC. If one side reads 24VDC and one side does not read 24VDC, contact SureFire. If both sides read 24VDC then power is good.

d. Does the red light blink? If so, then communication should be ok. If not, then contact SureFire.

Air in meter issues:

If the controller blinks "**Air In Mass Meter**" once in a while, that is normal operation.

If the controller says "Excessive Air In Mass Meter" then the product that was pumping may be empty, or a leak may exist to the product between the product valve on the QuickDraw and the chemical shuttle or tote.

Miscellaneous Issues:

If a product is not finishing but you can see the chemical level dropping in the shuttle or tote, then the **Slowdown Percentage** for that product is too low. Turbulence through the valve can cause the mass meter to not read, and turbulence is created if the valve is too far closed. Higher density products can increase the chance of this happening. Increase the set point for the valve with issues on the settings page to fix the issue.

QuickDraw Accessory Kit List

QuickDraw Chemical Shuttle Connection Kits

Flange Connection with no disconnect at QuickDraw

QuickDraw Valve #1	(uses 2” Hose)	606-01-200100
QuickDraw Valve #2-#6	(uses 1 1/2” Hose)	606-01-100100

Cam Lock Connection at Quick Draw (optional kit substitution to add valve at QuickDraw)

QuickDraw Valve #1	(uses 2” Hose)	606-01-200150
QuickDraw Valve #2-#6	(uses 1 1/4” Hose)	606-01-100150

The Cam Lock connection kits above can be modified to include a valve to disconnect with the hose full. The drawing lists the parts to substitute a valve. This will NOT be a dry disconnect and some product will leak when disconnected.

Poppet Style Dry Disconnect at QuickDraw

QuickDraw Valve #1	(uses 1 1/4” Hose)	606-01-200200
QuickDraw Valve #2-#6	(uses 1 1/4” Hose)	606-01-100200

The poppet dry disconnect will limit the maximum flow to about 25 gpm with water. Flow will be reduced below that depending on chemical viscosity. The poppet will negate the higher flow advantage of the larger QuickDraw valve #1.

QuickDraw Pump Connection Kit

3” Flange connection kit for 3” Transfer Pump 606-03-100100

The pump kit uses two 3” MPT x 3” flange fittings to connect to 3” threaded pumps. If a 3” flanged pump is used, the 3” MPT fittings can be removed from the kit.

QuickDraw Carrier Tank Refill Kit

Use when 3” pump is being used to fill the carrier tank 606-03-200100

QuickDraw Air Flush Kit

Use this kit to tap into the 3” line that comes out of the cabinet to the sprayer. Use air from the truck to blow this line empty. 606-03-300100

QuickDraw Sprayer Connection Kit

3” Hose, 3 Arm Cam Lock Fittings and hose end valve to fill sprayer with 606-04-100100

Some sprayers have the fill port mounted at 45 degrees so the hose will naturally hang with straight fittings. Other sprayers have the fill port mounted horizontally and you can substitute a 45 degree hose barb in this case for hose strain relief.

Accessory Kit List (Harnesses)

The accessory harnesses listed below all attach to the main QuickDraw harness, 208-05-2326Y1.

Power harness extensions from vehicle battery

480 MP Extension Harnesses 206-02-xxxxxx

QuickDraw has an internal battery to guarantee adequate power while running. However, it MUST be charged from the vehicle electrical system. Each QuickDraw includes a 20' power harness (205-2213Y1) to attach to the vehicle battery. If mounted further from the vehicle battery than 20' and/or crossing a trailer hitch, customer will need an extension harness.

Power harness to supply electric start gas engine transfer pump

QuickDraw Electric Start Gas Engine 12 Volt Supply Harness 208-05-2430Y1

The QuickDraw battery can be used to supply power for an electric start gas engine transfer pump. There is a 480 MP connector on the QuickDraw harness that attaches to this harness. It makes wiring an electric start transfer pump fast and easy without the need for an extra battery or wiring back to the vehicle battery. The harness is 15 feet long.

Pump Stop Harness (for electric or gas engine driven pump)

QuickDraw pump stop harness 208-05-2414Y1

QuickDraw has the ability to turn off the transfer pump. This harness provides a connection to a relay in the QuickDraw harness. The relay is normally closed, it then opens for 10 seconds when the pump is commanded to stop. Connect the harness to any wire on the engine that requires power for the pump to run. Comes with 4 mm bullet terminals which fit some pumps on the market.

Pump Start Harness (for electric driven pumps only)

QuickDraw electric motor drive pump start harness 208-05-2431Y1

QuickDraw has the ability to start an electric motor driven transfer pump. This harness provides a connection to a relay in the QuickDraw harness. The relay is normally open, it then closes for 1 second when the pump is commanded to start. Recommended for use along with the pump stop harness above

QuickDraw iPad App

The iPad App is not necessary to operate the QuickDraw in the field, but it does provide many convenience features, and the QuickDraw is intended to be used with an iPad. The iPad App is also the method necessary to download the Historical Data from the QuickDraw controller.

With the iPad App, new recipes can be created, existing recipes can be edited, and products and product data can be downloaded from the Greenbook database. These recipes and product information can then be downloaded to the QuickDraw controller via WIFI. Farm and field information can be set up in the iPad and transferred to the QuickDraw controller. Information that has been set up in the QuickDraw controller can be transferred to the iPad during the sync process.

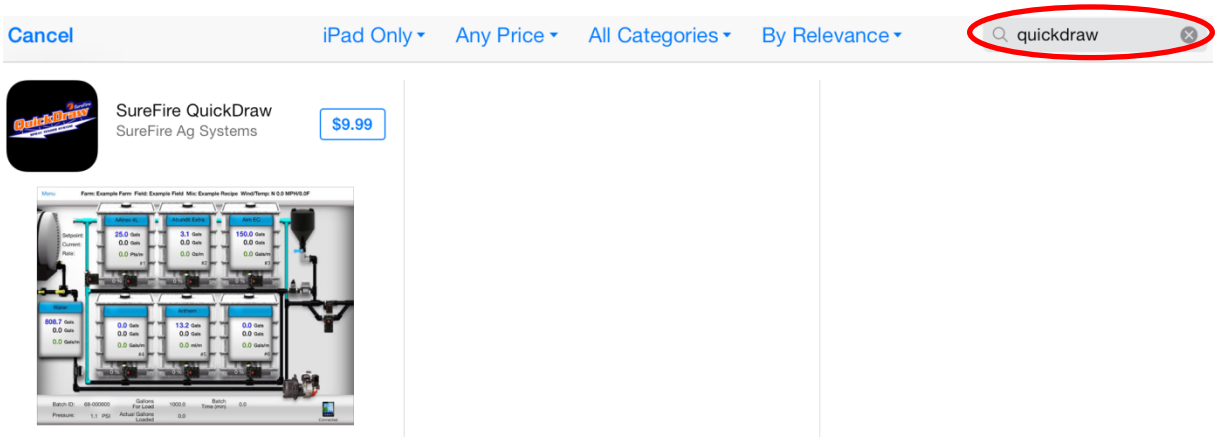
The QuickDraw controller keeps a historical log of each batch that is run. This information is stored in the controller with a unique Batch-id for each batch. The controller can store up to 255 batches in the controller memory. If this memory becomes full, each new batch will overwrite the oldest batch in memory. Typically, the user would download the Historical Data to the iPad before this memory becomes full. When the Historical Data is downloaded to the iPad, it is erased from the QuickDraw controller. Once the Historical Data has been transferred to the iPad, it can be sent by email as a CSV file which can be opened in Excel , or as a PDF document.

iPad App Install

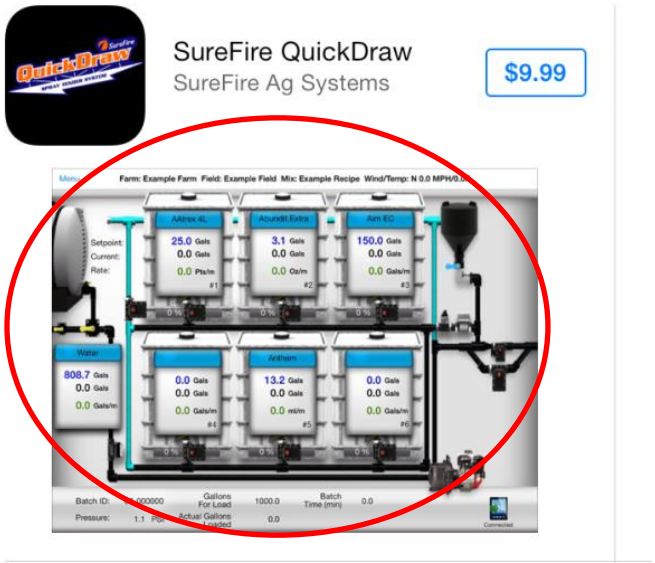
Click on App Store on your iPad.

After you have the QuickDraw app, check back periodically for updates.

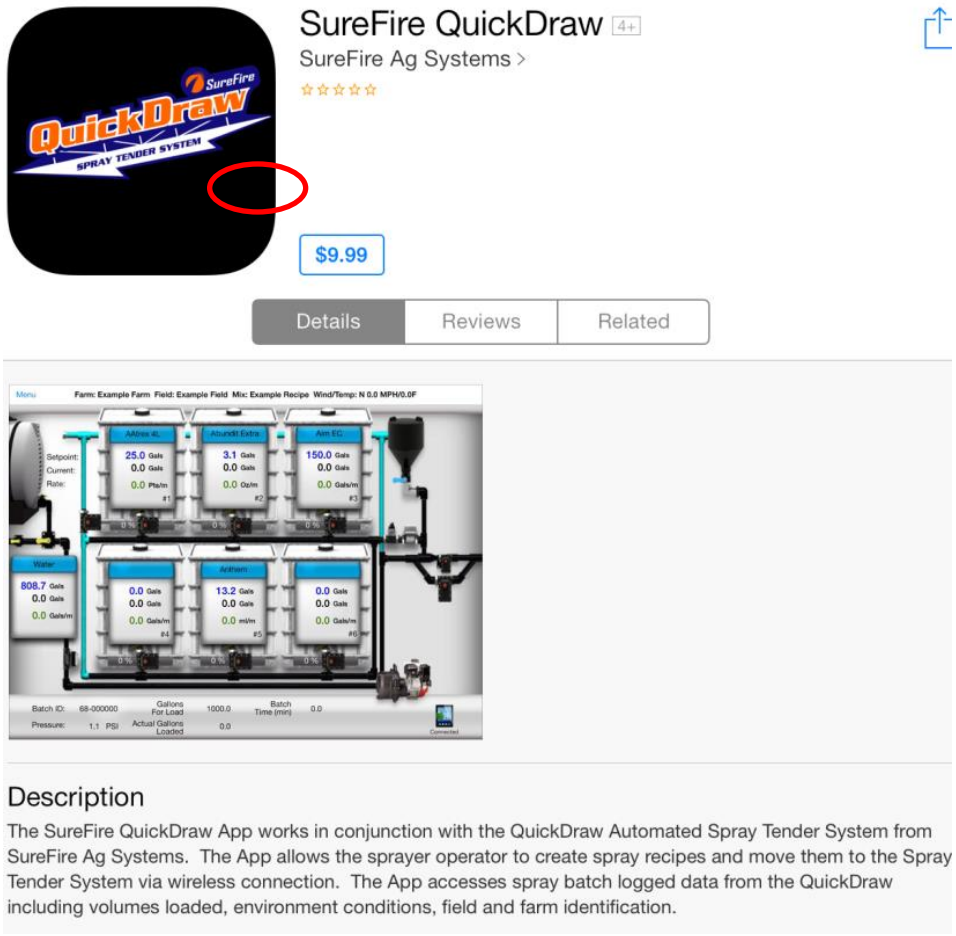
Next, type “quickdraw” into the search box in the top right corner.



Click on the App



Click on the $9.99 and follow the Apple instructions to download the App



Overview

This is the QuickDraw iPad App main menu.

Check the App Store periodically for updates to the QuickDraw App.

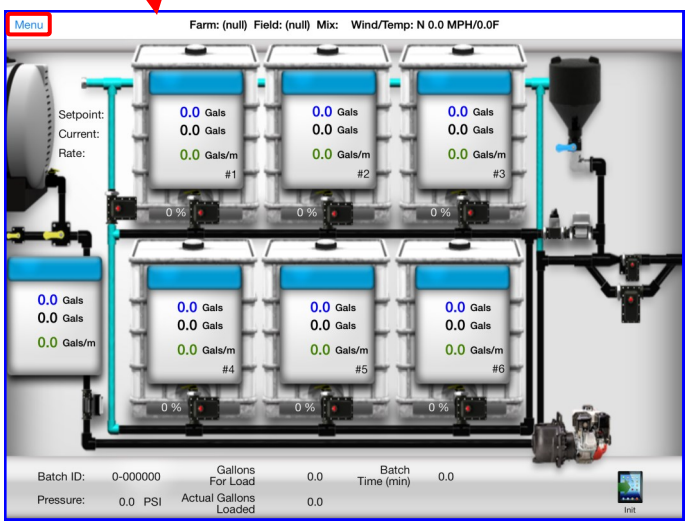
OVERVIEW opens a screen that shows the QuickDraw controller RUN SCREEN. If connected by WIFI to the QuickDraw controller, this screen will show what is happening as a batch is running.

RECIPE gives the option to EDIT a recipe or create a NEW recipe on the iPad.

OPERATIONS opens a screen where you can manage Farms, Fields, and Products. These items can be added, edited, synced, or exported from the Operations screen.

HISTORY gives you access to the historical batch records. You can search the historical data that is on the iPad, get new historical data from the controller, and email historical data from this screen.

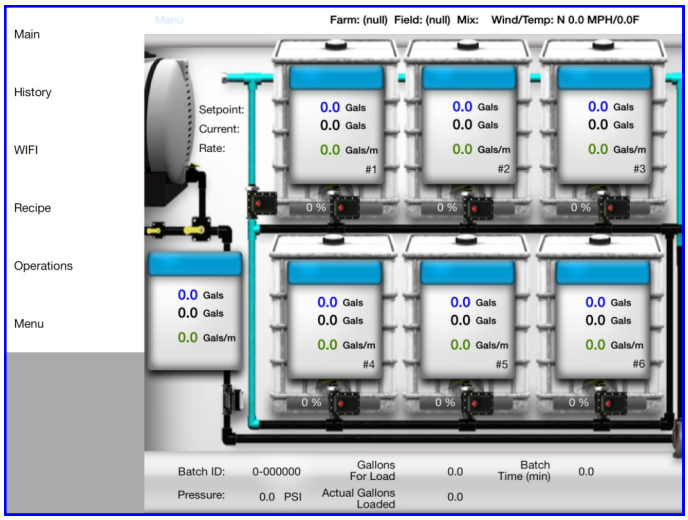
WIFI shows what your iPad WIFI is connected to.



The **OVERVIEW** screen shows the controller Run Screen when the iPad and controller are WIFI connected.

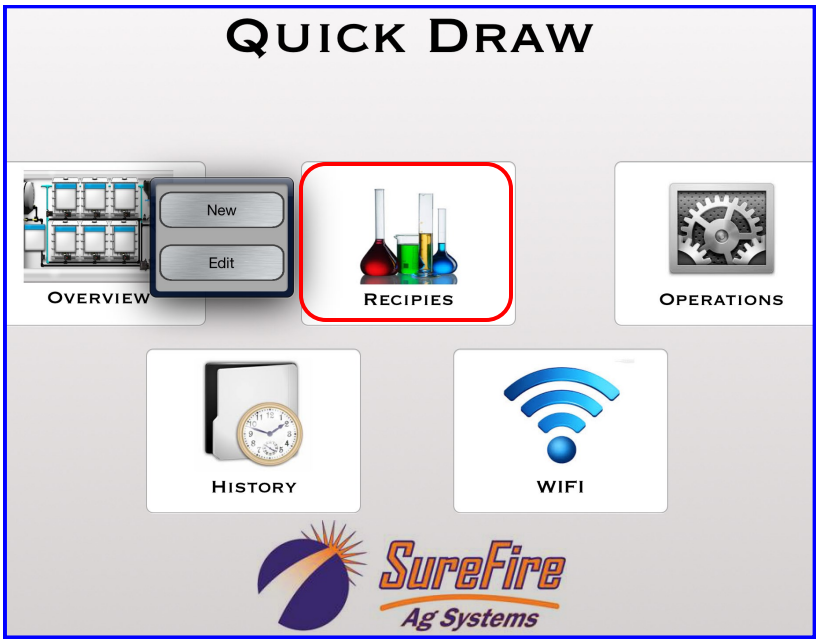
The screen will update as a batch is running.

If the recipe for the batch contains a Manual Product, the Manual Product Add screen will show on the iPad and the Manual Product addition can be verified on the iPad.

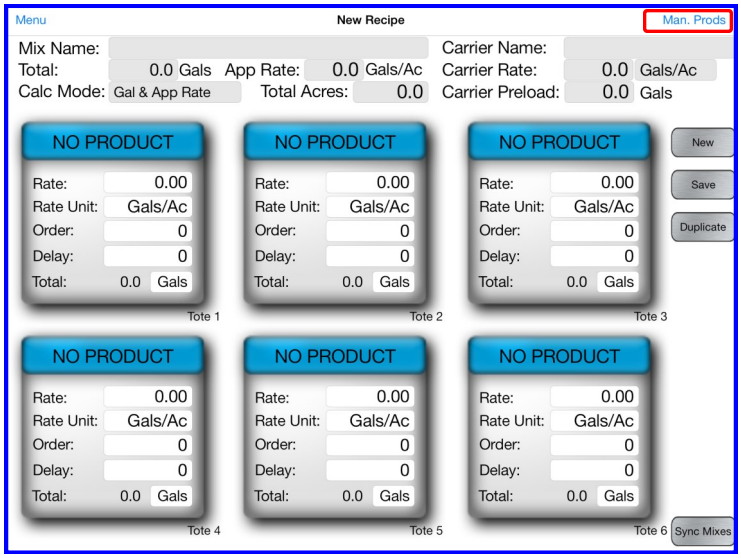


Pressing **Menu** in the upper left corner will give the Menu choices along the left side.

Recipes



Pressing **RECIPES** from the main menu or from one of the side menus will give you a choice to make a **New** recipe or to **Edit** an existing recipe.



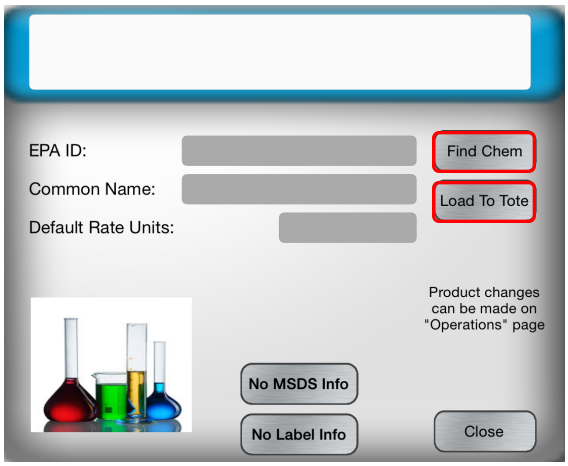
When creating a **New** Recipe, fill in the **Mix Name** and **Carrier Name.** The bulk products in shuttles or totes are set up on the first screen.

To add a manual product or a product with less than 2 gallons for a batch, select **Man. Prods** in the upper right corner.

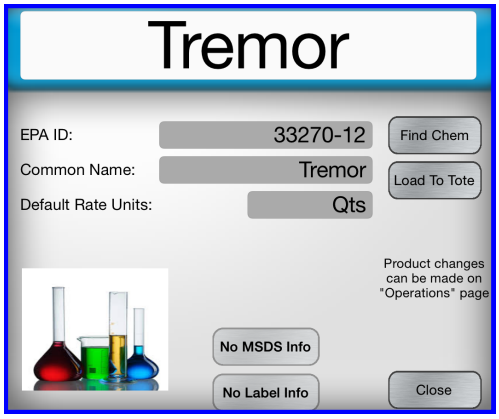
The other items at the top of the first screen (Total, Gals, Gals/Ac, Carrier Rate, Calc Mode, Total Acres, and Carrier Preload) can be set now or can be edited later when running an individual batch.

Click on the blue box at the top of each tote to add a new product to the recipe. This brings up the following box. Click on **Find Chem**. This opens up the Product List to select a product. After selecting the product, click on **Load To Tote**. (*The iPad must have an internet connection to access the Greenbook Database for MSDS or Label Info.)*

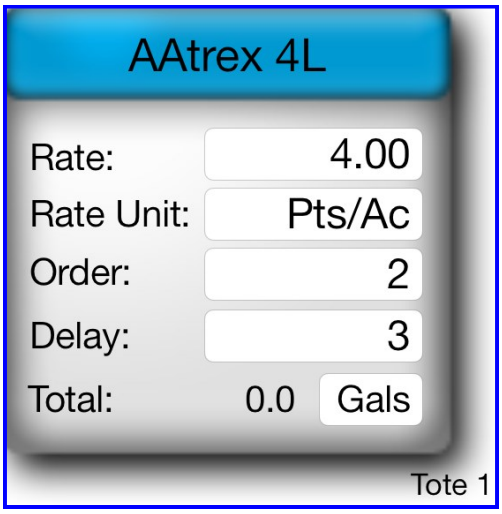
Add Manual products here:



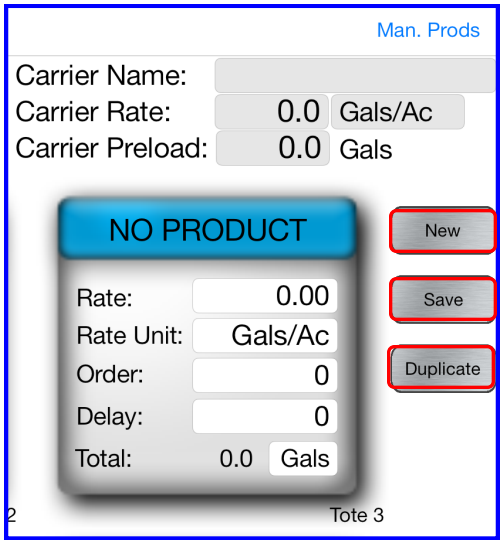
Recipes



Here, the product Tremor has been selected. It will be added to the recipe by pressing **Load To Tote**. Notice also that the **MSDS Info** and **Label Info** can be accessed here if the iPad is connected to the internet.



After a product has been added to the recipe, the **Rate, Order,** and **Delay** can be entered. Any of these items may be edited later on from the iPad or from the controller (after the recipe has been synced to the controller). **Order** is the order in which the products will be added to the batch. There must be one sequential set of numbers beginning with 1 and including all the products in totes plus any manually added products. The **Delay** is the number of seconds that the rinse valve will open to flush clean water through the header before this product is added. SureFire recommends *at least a 3 second delay* be set for each product in the recipe.

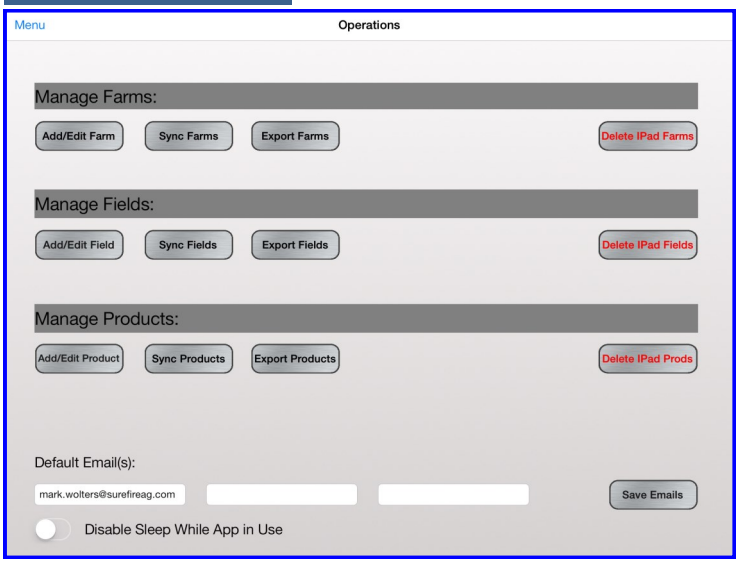


Press **New** to start a new recipe.

Press **Save** to save a recipe that has been entered.

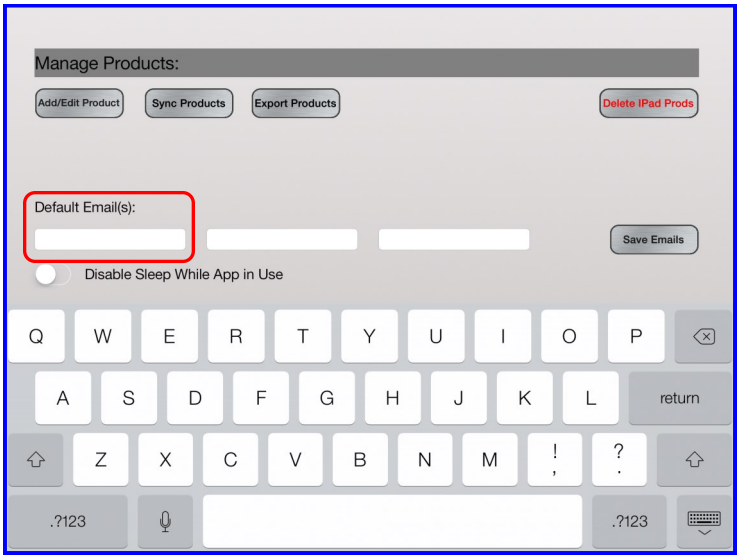
Press **Duplicate** if you would like to make minor changes to an existing recipe and still save both recipes. Pressing **Duplicate** will bring up a screen where you select an existing recipe. When that recipe comes to the screen, change the name to the name for the new recipe, make any changes to the recipe, and press **Save**. The original recipe and the new changed recipe will now both be in the recipe list. This saves time by not having to add and set up every product for the new recipe when much of it is similar to an existing recipe.

Operations



Pressing **Operations** from the main menu or from one of the left-side menus will bring up the screen to manage farms, fields, and products. Here, records can be added, edited, synced with the controller, or exported and emailed.

To **Add/Edit** a product use this pop-up screen. **Find Chem** brings up the list of products that are on the iPad. **Import New From Greenbook** will open up a search screen to search for products from the Greenbook database that are not in the iPad product list. The iPad must be connected to the internet to use this feature.



Tapping in a white box by **Default Email (s)** will bring up the keyboard to enter email addresses where you want to send exported data. The data is exported in a .qdd file which can be emailed to another iPad and imported into the QuickDraw App on that iPad. To import the data on a second iPad, tap the QDD file in the email to download the file. Then, touch and hold the QDD file icon to bring up the screen that will have the option to **Open in QuickDraw**. Press this to complete the import process.


SureFire
QuickDraw
SPRAY TENDER SYSTEM

QuickDraw App Data Hierarchy

Import/Export File

The .qdd file extension is just a comma separated value file (csv) with a different extension name. It is changed so when the file is selected in an email, the QuickDraw app is one of the options brought up to open the file, which then prompts the user about importing. At this point, a person could the open the file and alter it in Excel or a text editor, but importing an altered file could have serious consequences on the users database unless everything is formatted properly.

Products

The QuickDraw controller can only hold 255 products. If a sync is attempted when the iPad has more than 255 products, it will import 255 and then signal that the controller is full. Products that only exist in the iPad will appear blue when searching through the product list. If during a sync process a product key gets changed in the iPad, the program will search mixes and adjust it so the proper product key is used in the mix.

On a product import (QDD file import into iPad):

-If a product with that EPAID exists in iPad, any changes in the imported product will overwrite iPad product (if a default unit is changed, that will not disturb any units in mixes where it is used). IT WILL NOT CREATE A SECOND VERSION.

-If the EPAID is blank, it will search if product name exists and will do the same as above.

-New products will be stored for syncing to controller.

On a product sync:

-Duplicate names can be created in the iPad and Controller, but the iPad will not allow the creation of a product that has the same EPAID as an already existing product.

-If existing product has changed in both controller and iPad, the user will be prompted which to use.

-If a product is deleted in the iPad, but not the controller (or vice versa), the user will be prompted if they wish to delete it in the other. If answer is no, it will be restored in the unit that had it deleted. Products can only be deleted if they are not used in mixes.

-New products in the controller or iPad will automatically be transferred to the one that doesn't have it.

Recipes

The QuickDraw controller can only hold 255 recipes. If a sync is attempted when the iPad has more than 255 recipes, it will import 255 and then signal that the controller is full. Recipes that only exist in the iPad will appear blue when searching through the product list.

On a recipe import (QDD file import into iPad):

-If a recipe with that name exists in iPad, any changes in the imported recipe will overwrite iPad recipe. IT WILL NOT CREATE A SECOND VERSION.

-New recipes will be stored for syncing to controller

-If a single recipe is exported using the iPad, it will also generate a Prod.qdd file containing all of the products in that single recipe. The product file needs to be imported before the recipe file.

-If for some reason a recipe gets imported with a product that doesn't exist in the iPad, it will be assigned with a key of 65535 which will prompt the user to select a valid product when the recipe is opened for edit. The recipe will not be synced with the controller until a valid product is entered.

On a recipe sync:

-To maintain data integrity, a product sync is done first.
-Duplicate names can be created in the Controller, but not in the iPad.
-If existing recipe has changed in both controller and iPad, the user will be prompted which to use.
-If a recipe is deleted in the iPad, but not the controller (or vice versa), the user will be prompted if they wish to delete it in the other. If answer is no, it will be restored in the unit that had it deleted.
-New recipes in the controller or iPad will automatically be transferred to the one that doesn't have it.

Farm/Field

The QuickDraw controller can only hold 255 farms and 255 fields. If a sync is attempted when the iPad has more than 255 farms/fields, it will import 255 and then signal that the controller is full. Farms/fields that only exist in the iPad will appear blue when searching through the product list.

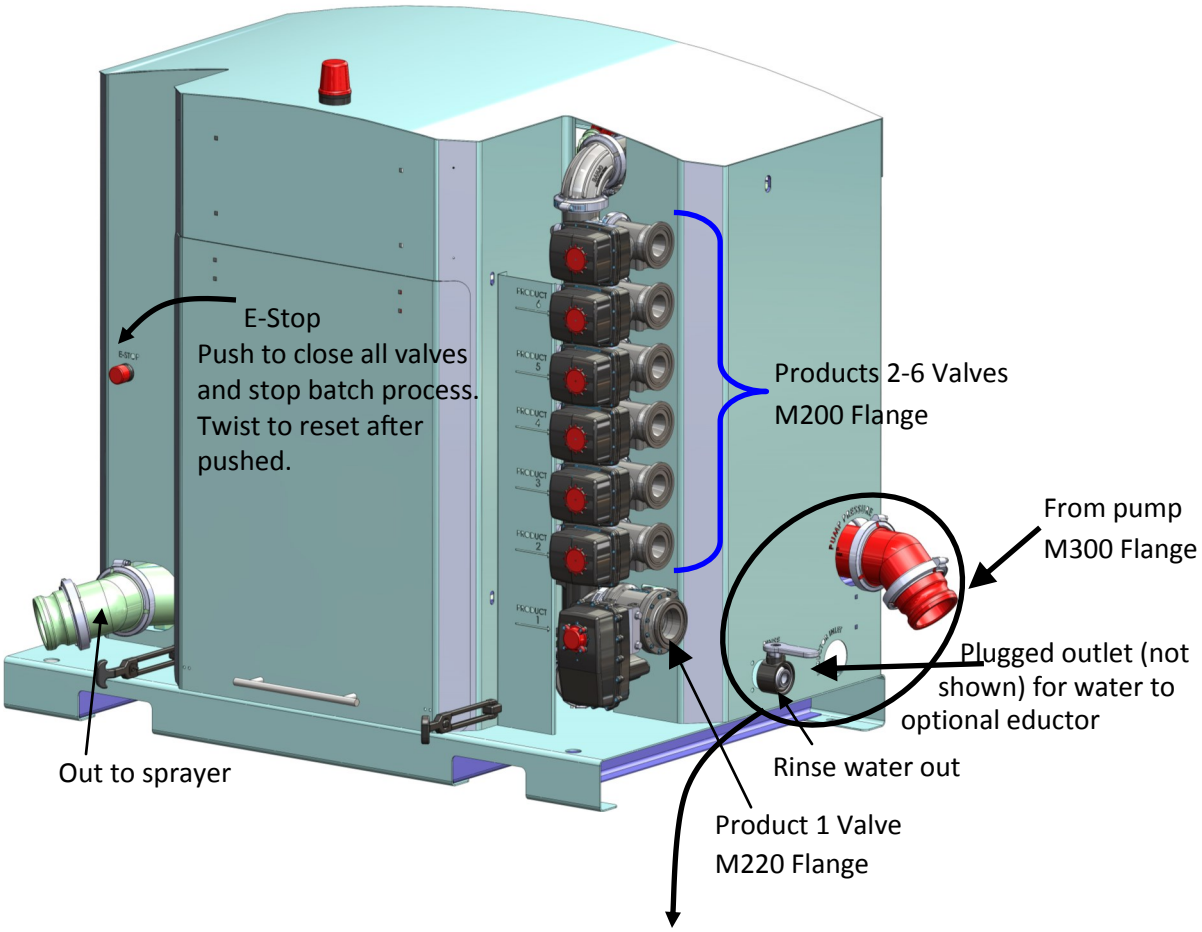
On a farm/field import (QDD file import into iPad):

-If a farm/field with that name exists in iPad, the farms/field will remain in the iPad. IT WILL NOT CREATE A SECOND VERSION.

On a sync Farm/Field:

-Duplicate names cannot be created in the iPad, but they can in the controller.
-If existing farm/field has changed in both controller and iPad, the user will be prompted which to use.
-If a farm/field is deleted in the iPad, but not the controller (or vice versa), the user will be prompted if they wish to delete it in the other. If answer is no, it will be restored in the unit that had it deleted.
-New farms/fields in the controller or iPad will automatically be transferred to the one that doesn't have it.

QuickDraw External Plumbing Fittings

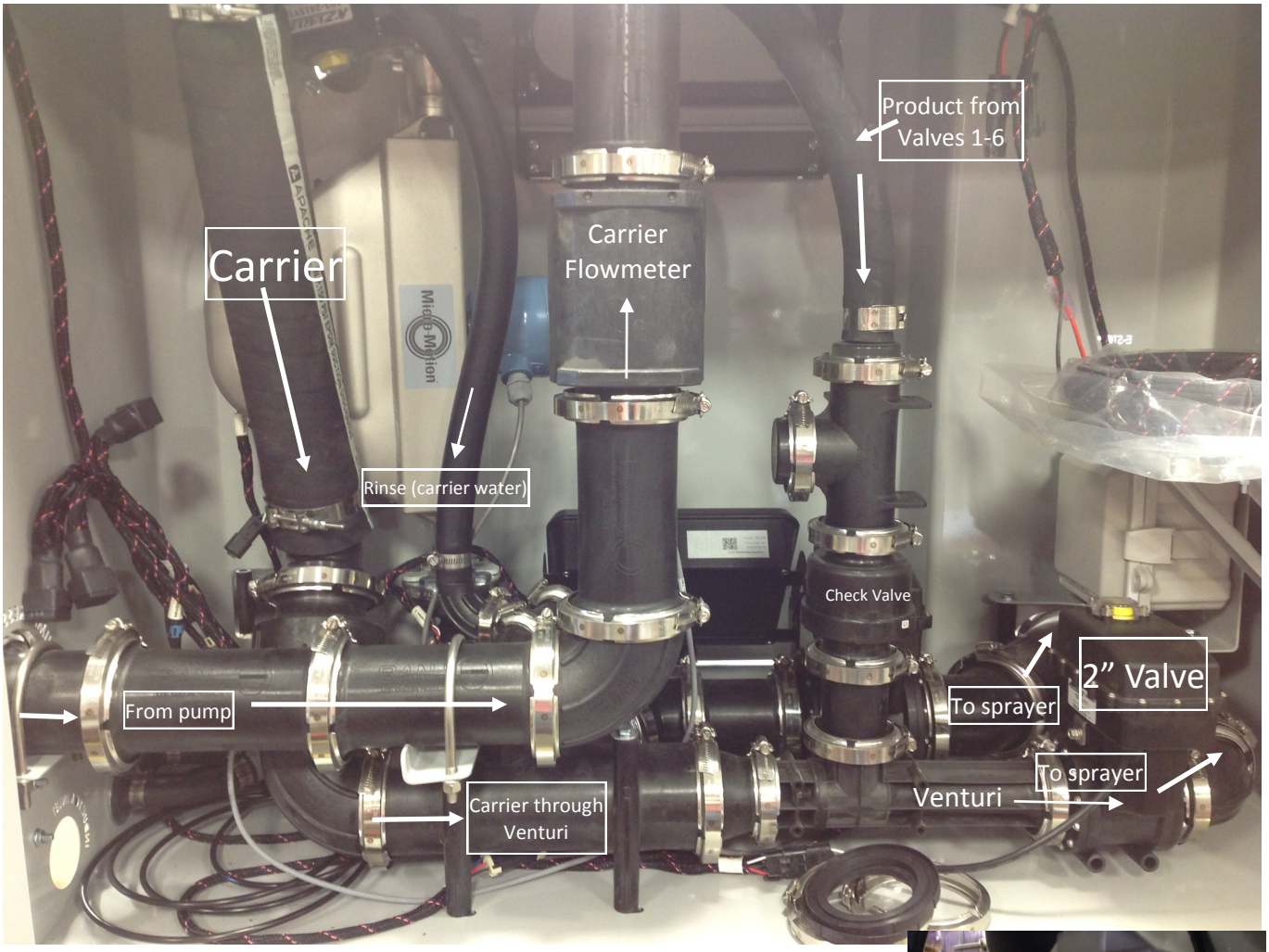


Connect hose here to get rinse water that can be used outside the cabinet

Connect hose here to get water that can be used to feed the optional eductor

It is absolutely essential that there be no air leaks on the suction side of the system. Air leaks on the suction side will create difficulty with priming and will cause erratic flowmeter operation.

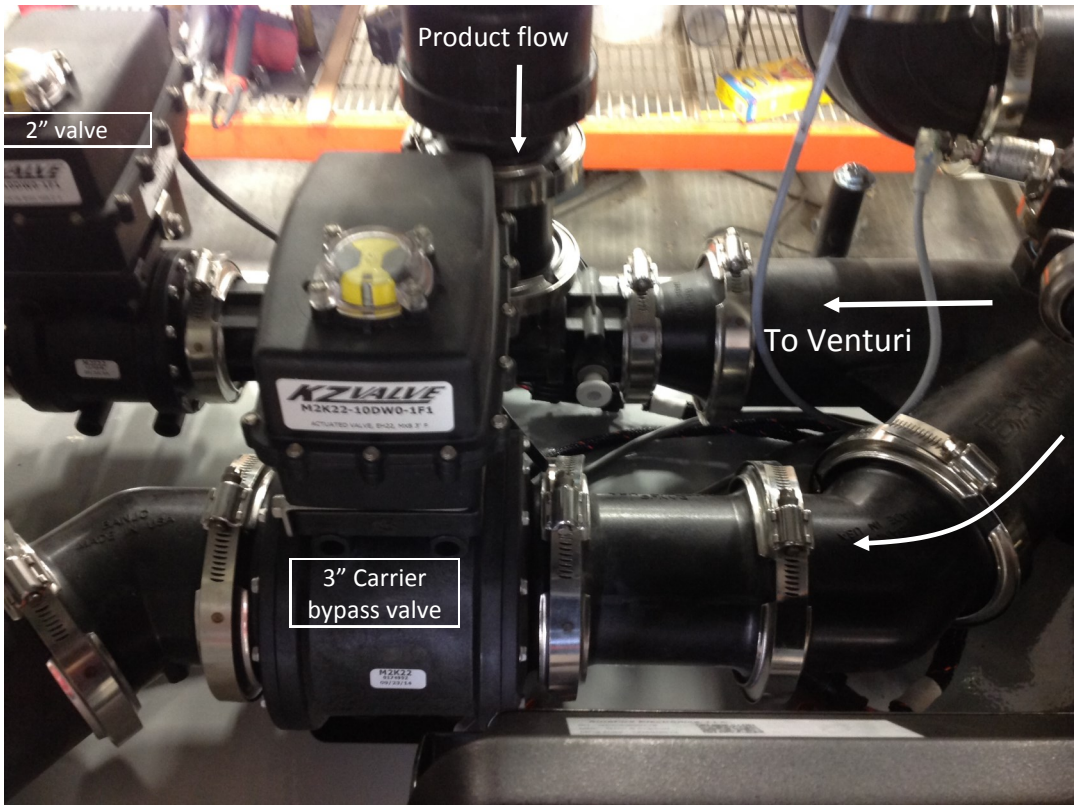
Carrier / Product Plumbing and Flow



When products are being added to a batch, the 2” valve is open so carrier flows through the Venturi (40 GPM). This creates a vacuum to suck each product from the tote as the valve for that product is opened. As it comes from the tote, the product passes through the product flowmeter shown at the right. The product then mixes with the carrier on the way to the sprayer. When all the products have been added, the 2” Valve closes and the 3” bypass valve opens which allows full carrier flow (180-220 GPM depending on pump) to the sprayer to complete the batch.

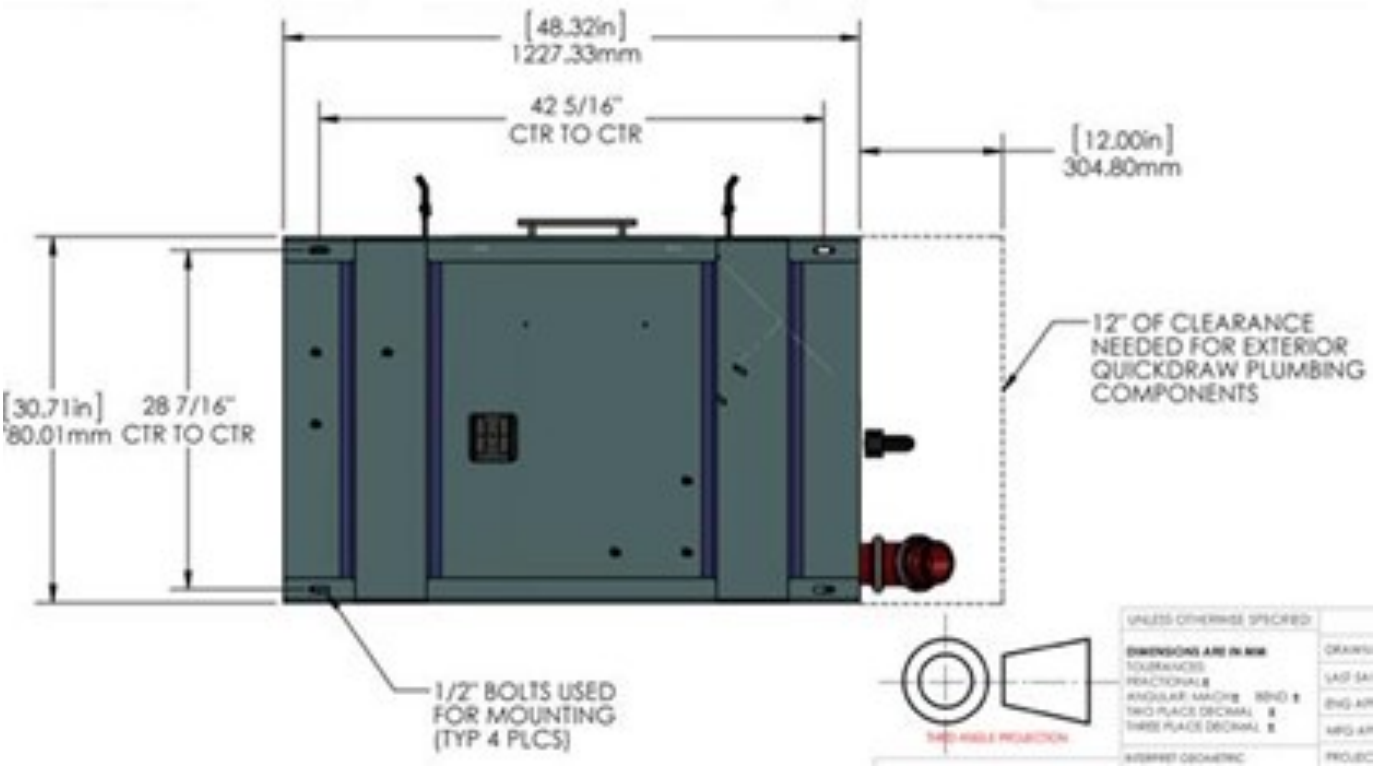
See photo on the next page to see a view of the 3” valve and 2” valve from the front of the cabinet.

The products flow through the mass meter flowmeter.



As seen from the front of the QuickDraw, the carrier will either flow through the 3” bypass valve or the 2” valve (when pulling product through venturi).

QuickDraw Cabinet Floor Mounting Template



Glossary of Terms

Batch—A combination of carrier (water) plus chemicals that will be measured and put in the sprayer at a specific moment in time for a specific use.

Calculation Mode—The method that the QuickDraw controller will use to calculate the amount of carrier and the amount of each product (chemical) that is needed for a batch. The 4 modes are Gallons and Application Rate, Acres and Application Rate, Volume, and Acres and Carrier Rate.

Carrier—Typically water. Could be a liquid fertilizer product that is used as the carrier liquid in a spray batch.

E-stop—Emergency stop. Push the red button on the front of the QuickDraw cabinet to close the valves and stop the loading process. If wired to do so, this will also kill the pump.

History—The record of each batch that is made. Contains Batch ID number, Farm, Field, Recipe, Date, Time, Wind Speed and Direction, Temperature, Products used, rate per acre and total amount of each product, rate per acre and total amount of carrier, name and EPA ID of each chemical product, Total volume of batch, application rate intended for batch, and number of acres batch was mixed for. The history can be transferred from the controller to the iPad, and then emailed as a PDF or as a csv file.

Job—All the information needed to create a batch. The job has the information of Farm, Field, Recipe, carrier and product (chemical) names and rates, mixing order, pre-rinse time, volume of product to use, how much carrier to preload to the sprayer, calculation mode used, total acres, total volume, application rate.

Mass Meter—The Micro Motion mass flowmeter used to measure the product dispensed.

Mix—Same as recipe.

Pre-Load—An amount of carrier that will be pumped into the sprayer before any chemicals are added.

Pre-Rinse—A flushing of the product valve stack header with carrier prior to the addition of a chemical. Designed to prevent any unwanted mixing of chemicals prior to reaching the sprayer. Typically this is set as a 3-second rinse. Can be set longer if desired.

Product—A chemical (could be a herbicide, insecticide, pesticide, etc.) that will be mixed into a spray batch. A product can either be in a tote attached to a QuickDraw valve to be automatically dispensed into the mix, or can be a manually added product (can be liquid or dry).

Recipe—A set of instructions that tells which carrier and which products (chemicals) to use, the rate per acre to use, the order in which they should be added , and the pre-rinse time for each product.

SSID—The WIFI network name to which the iPad will connect to interact with the QuickDraw controller.

Tote—Tote, shuttle, or tank that holds a chemical that is connected to one of the QuickDraw valves and that will be metered automatically into a batch.