Avery Weigh-Tronix

SIMPLY ACCURATE

Model 2060

Multipurpose Weigh Indicator

Quick User Guide

AWT35-501508
Issue AA

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1 Overview

This section includes information on core features of the Model 2060. This guide is meant as a Quick Start resource, please refer to the 2060 User Manual (P/N AWT35-501506) for more detailed instructions.

1.1 Turning Unit ON/OFF

Turn on the 2060

1. Press the key while the unit is off. The unit will go through a boot up routine while showing “Avery Weigh-Tronix "Loading App”.
2. The display will show the main Home Screen, with Field Foreman Logo displayed.

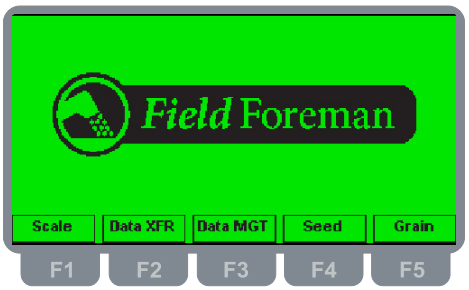


Figure 1.1 Home Screen

Turn off the 2060

1. To turn unit off press the key for 3 seconds.
2. A prompt will be displayed and ask "Shutdown! Are you sure?". Press **F2/▼** to select ***Yes*** and press **F3/ ↵**.

Figure 1.2 Shutdown Screen

1.2 Front Panel Keys

The 2060 front panel consists of the keys and the display.

Never press a key with anything but your finger. Damage to the overlay may result if sharp or rough objects are used.

The functions of each key on the front panel are listed below.

TARE	**Scale Mode**	Press to perform a tare function or prompts for a keyboard tare, if enabled.
	Scale Mode **Access Menus** **Planting and Harvest Modes**	Press to perform a tare function or prompts for a keyboard tare, if enabled.
SELECT	**Scale Mode**	Press to toggle between Gross, Net, Tare and any other active display values.
	Menu Navigation	Select menu items.
PRINT	**Scale Mode** **Access Menus**	Press to send information to a peripheral device (printer, computer or other serial device module).
HOME	**Scale Mode** **Access Menus** **Planting and Harvest Modes**	In any mode you press to return to home screen or hold down for 3 seconds to access password screen
ZERO	**Scale Mode** **Access Menus** **Planting and Harvest Modes**	Zeros in both scale and application mode
BACK	**Scale mode** **Access Menus** **Planting and Harvest Modes**	Press to back up one screen.
HOLD	**Scale Mode** **Access Menus** **Planting and Harvest Modes**	Press to hold a weight.
GROSS/NET	**Scale Mode** **Access Menus** **Planting and Harvest Modes**	Press to toggle between the Gross and Net weight.

F1	**Access Menus** **Planting and Harvest Modes** **Scale Mode**	Press the **F1** key to select application specific choices.
F2		Press the **F2** key to select application specific choices. Press the **F2** key from the Scale Mode to go into the Load mode.
F3		Press the **F3** key to select application specific choices. Press the **F3** key to stop Load/Unload in scale mode.
F4		Press the **F4** key to select application specific choices. Press the **F4** key from the Scale Mode to go into the Unload mode.
F5		Press the **F5** key to select application specific choices. Press the **F5** key from the Scale Mode to reset target weight.
	Scale mode **Access Menus** **Planting and Harvest Modes**	Use the numeric keypad to enter numbers and letters in the appropriate screens. Press the **CLEAR** key to clear the last entry.

1.3 Summary of Home Screen Modes

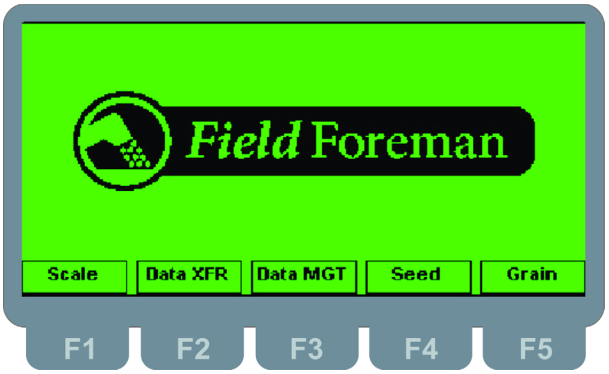


Figure 1.3 Home Screen

1.3.1 Scale (F1)

Access basic weighing Scale Mode and Loading/Unloading modes.

1.3.2 Data XFER (F2)

Used to transfer data via USB to and from Farm Foreman PC Package P/N AWT05-508725. Refer to the Farm Foreman PC User manual for instruction on setup and use of the PC package software.

1.3.3 Data MGT (F3)

Used to enter Grain Types, Hybrids, Fields, Trucks, Locations, IDs, Seed Tenders, Planters, Treatments if not using the Farm Foreman PC Package. Refer to the 2060 User Manual for more details.

1.3.4 Seed (F4)

Access Seed Tender mode (Planting). Capable of complete management of a Hopper style Tender or Probox Style Tender (maximum of 8 Proboxes or hoppers). Refer to the Planting section starting on page 21.

1.3.5 Grain (F5)

Access Grain Mode to track and record all harvest transactions. Refer to the Planting section starting on page 13.

1.4 Simple Weighing

Utilizing the Gross/Tare/Net function is a simple method to accurately weigh basic single weight transactions or for weight transactions with multiple loads or product.

Gross

The gross weight parameter represents the total live weight on the scale since the last time a zero reference was established by pressing the ZERO (**ZERO**) key. The gross weight is calculated internally and its value cannot be changed by any other means.

Tare

The tare weight parameter represents a deduction from gross weight made to allow for the weight of an empty truck, container, or other such weight not to be considered as part of the resulting net weight.

Net

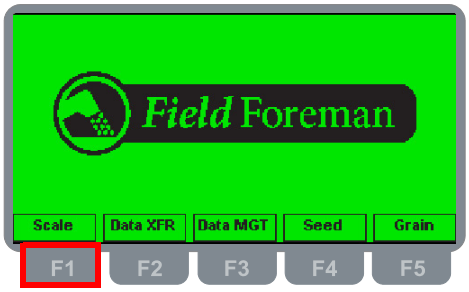
The net weight parameter represents the difference between gross and tare:

NET = GROSS - TARE

The net weight can be used to determine the weight of product in a container if the tare weight of the container has been established. The net weight is also used for multiple ingredient filling applications where a new tare weight is established prior to each fill. Thus each ingredient can fill from a net weight of zero to the desired target net weight while the gross weight is still also being tracked. The net weight is calculated internally and its value can only be changed by pressing the TARE (**TARE**) key (show key icon) specifying a new tare weight.

1.4.1 How to Use the Basic Weigh Mode

1. From the ***Field Foreman*** Home screen, press the **F1/Scale** key to select the scale mode.



2. The current gross weight will be displayed. Press the GROSS/NET key to view the gross or net mode.
3. Remove all materials from the scale.
4. Press the ZERO key on the screen.
5. Place weight on the scale.

1.5 Load / Unload

1. From the ***Field Foreman*** Home screen, press the **F1/Scale** key.

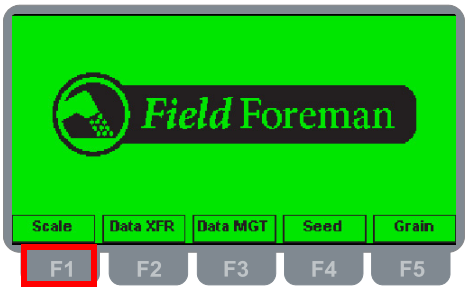


Figure 1.4 Field Foreman Home Screen

2. The base scale mode will be displayed.

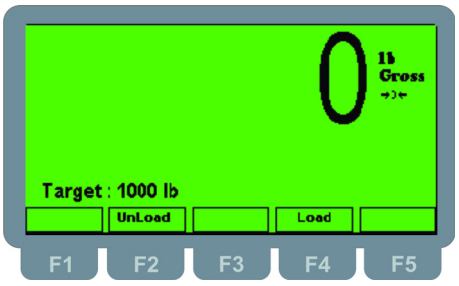


Figure 1.5 Scale Mode Screen

3. Key in the target weight using the numeric keys and press the **F2/UnLoad** or **F4/Load** key. The new target will be displayed.

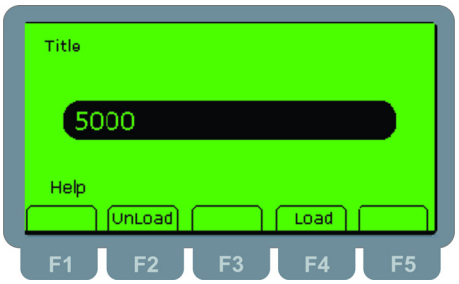


Figure 1.6 Enter Target Weight

4. The process of loading or unloading are very similar. The Target weight to Unload/Load will be displayed with a full bar graph. As you get closer to the target weight, the bar graph will get smaller.

Figure 1.7 Scale Unload

Figure 1.8 Scale Load

5. Once the target weight is met three options will be available:
   - Press **F5/Reset** which will "reset" the scale with the previously used target weight.
   - Press **F3/Stop** to return to the G/T/N scale mode.
   - Use the keypad to enter in a new weight and select either **F2/Unload** or **F4/Load**.

6. Press the BACK key to return to the ***Field Foreman*** Home Screen.

1.6 Manage User Setup/Import with the 2060

From the ***Field Foreman*** screen, press the **F2 / Data XFR** key.

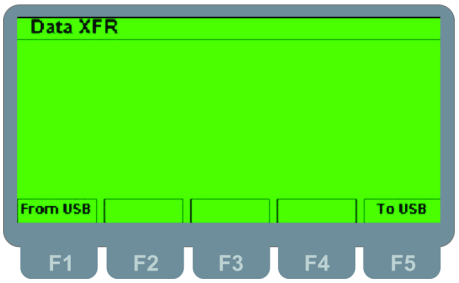


Figure 1.9 Data Transfer Screen

1.6.1 Load Setup File from USB (F1)

Use to load the setup file from Farm Foreman PC.

1. Copy the Farm Foreman setup file to a USB stick.
2. Insert the USB stick into the USB port of the Model 2060.
3. Press the **F1** key.
4. The display will prompt ***Copy FarmForeman_Setup.db?***. Use the **F1/▲** or **F2/▼** key to highlight **Yes**.
5. Press the **F3/↵** key to start the download.
6. The display will show ***Done*** briefly when the transfer has finished.
7. Press the **BACK** key to exit the ***Data XFR*** screen.

1.6.2 Copy Planting and Harvest Transaction Files to USB (F5)

Used to transfer changes made and planting transactions via the 2060 indicator to the USB stick. Load this file into the Farm Foreman PC software to manage transactions and print reports.

1. Insert the USB stick into the USB port of the Model 2060.
2. Press the **F5/▲** key.
3. The display will prompt ***Copy FarmForeman_Txn.db?***. Use the **F1/▲** or **F2/▼** key to highlight **Yes**.

   Press **F5/▲** to exit the copy process.
4. Press the **F3/↵** key to start the download.
5. The display will show ***Done*** briefly when the transfer has finished.
6. Press the **BACK** key to exit the ***Data XFR*** screen.

2 Harvest Process

This section covers accessing the Harvest mode, harvest setup and loading a grain cart. Refer to the 2060 User Manual (P/N AWT35-501506) for more details on Harvesting.

2.1 Access the Harvest Mode

1. From the ***Field Foreman*** Home screen, press the **F5/Grain** key.

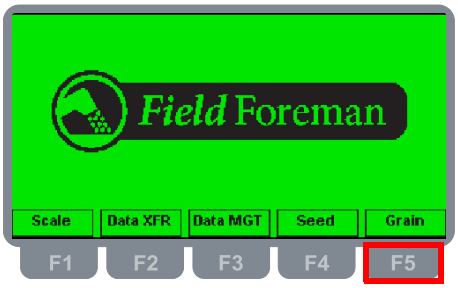


Figure 2.1 Field Foreman Home Screen

2. The ***Harvest Data*** screen will be accessed.

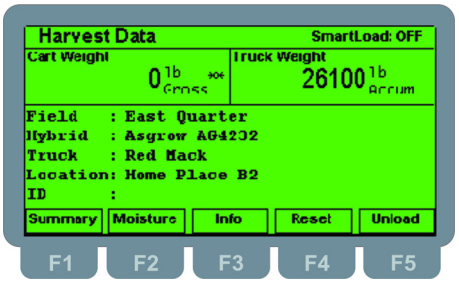


Figure 2.2 Harvest Data Screen

2.2 Setup Harvesting

Prior to unloading the grain cart it is necessary to Select Field, Truck, and delivery location. The ID is an optional selection. Press **F3/Info** to make these choices.

1. Press the **F3/** ↵ key from the ***Harvest Data*** screen.

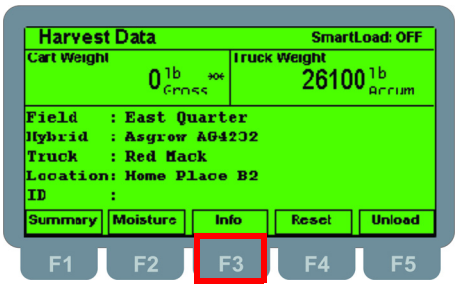


Figure 2.3 The Info Key

2. The ***Harvest Info*** screen will be displayed.

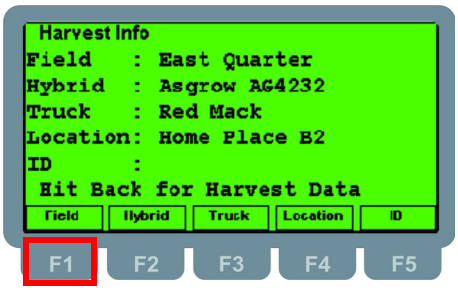


Figure 2.4 Harvest Info Screen

2.2.1 Select a Field (F1)

1. Press **F1/Field** from the ***Harvest Info*** screen.

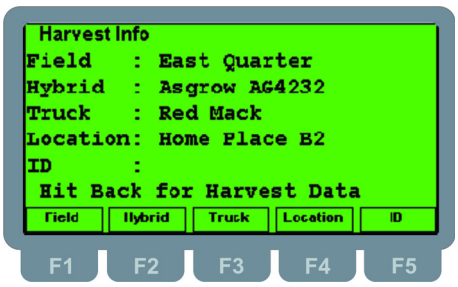


Figure 2.5 Harvest Info Screen

2. The ***Field Selection*** screen will be displayed. The choices will appear in alphanumerical order. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

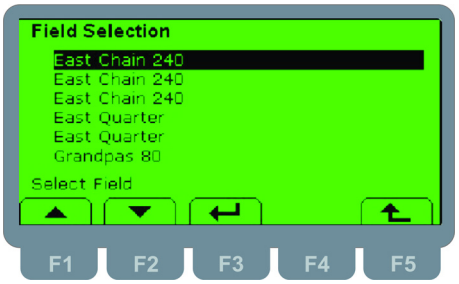


Figure 2.6 Select a Field

3. Press **F3/** ↵ when the desired field is highlighted. The ***Harvest Info*** screen will be displayed. Notice the hybrid will change to the hybrid preassigned to that field.

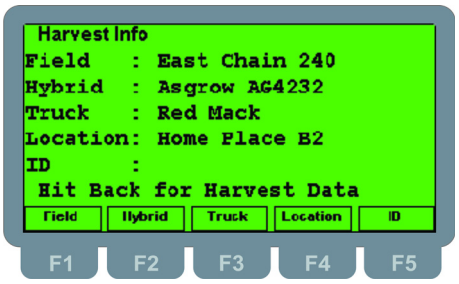


Figure 2.7 Field is Added

4. Once all of the selections are correct press the **BACK** key.

2.2.2 Select a Hybrid (F2)

1. If the preassigned Hybrid is incorrect press **F2/Hybrid** from the ***Harvest Info*** screen..

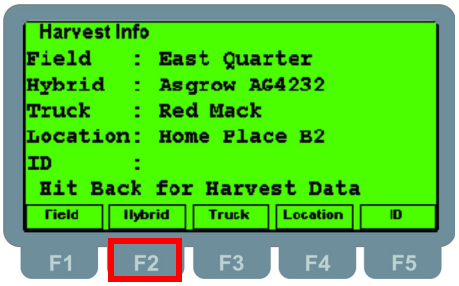


Figure 2.8 Harvest Info Screen

2. The ***Hybrid Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

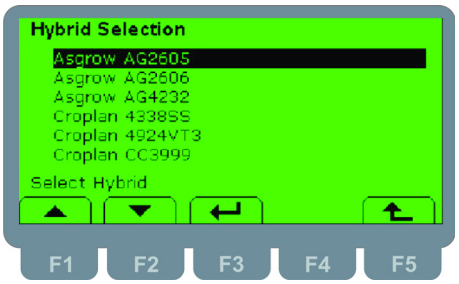


Figure 2.9 Select a Hybrid

3. Press **F3/↵** when the desired hybrid is highlighted. The ***Harvest Info*** screen will be displayed.

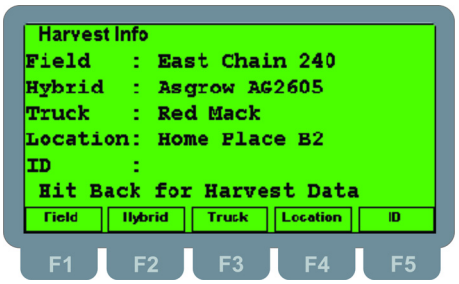


Figure 2.10 Hybrid is Added

2.2.3 Select a Truck (F3)

1. Press **F3/Truck** from the ***Harvest Info*** screen.

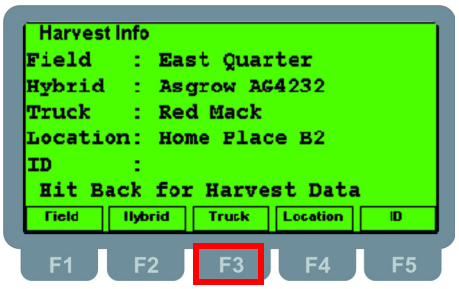


Figure 2.11 Harvest Info Screen

2. The ***Truck Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

Figure 2.12 Select a Truck

3. Press **F3/↵** when the desired truck is highlighted. The ***Harvest Info*** screen will be displayed.

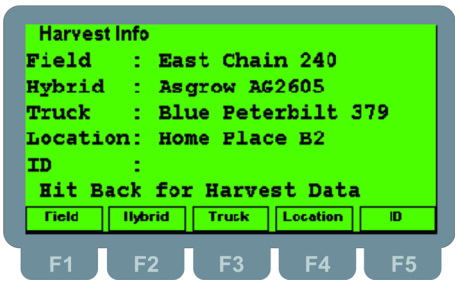


Figure 2.13 Truck is Added

2.2.4 Select a Location (F4)

1. Press **F4/Location** from the ***Harvest Info*** screen.This will be the location that the grain is delivered to by the Truck.

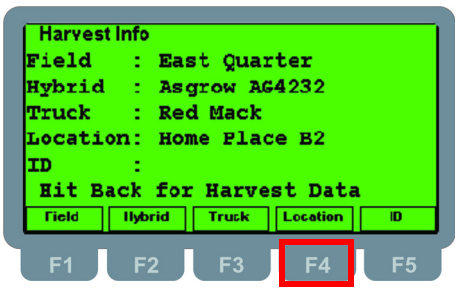


Figure 2.14 Select a Location

2. The ***Location Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

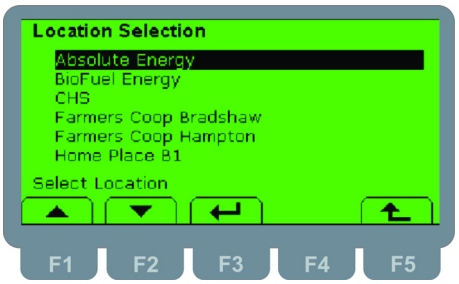


Figure 2.15 Select a Location

3. Press **F3/↵** when the desired location is highlighted. The ***Harvest Info*** screen will be displayed.

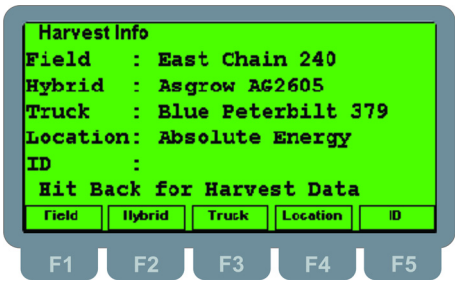


Figure 2.16 Location is Added

2.2.5 Select an ID (F5)

The ID selection is an optional field and does not need to be used.

1. Press **F5/ID** from the ***Harvest Info*** screen.

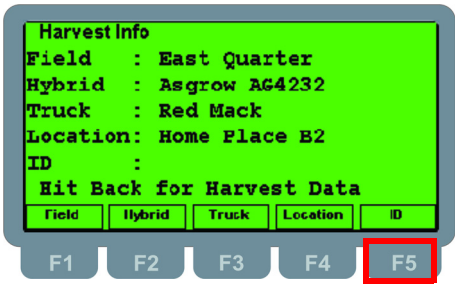


Figure 2.17 Harvest Info Screen

2. The ***ID Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

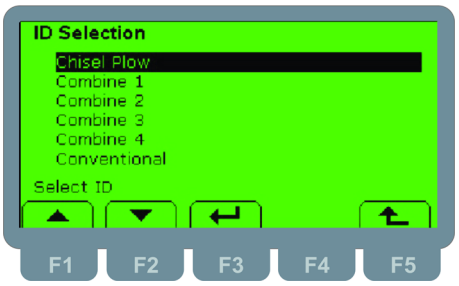


Figure 2.18 Select an ID

3. Press **F3/↵** when the desired ID is highlighted. The ***Planting Info*** screen will be displayed.

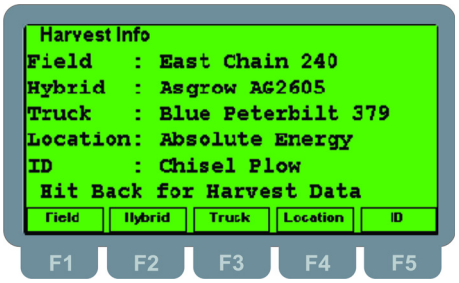


Figure 2.19 ID is Added

2.3 Load the Grain Cart

1. From the ***Field Foreman*** screen press the **F5/Grain** key.

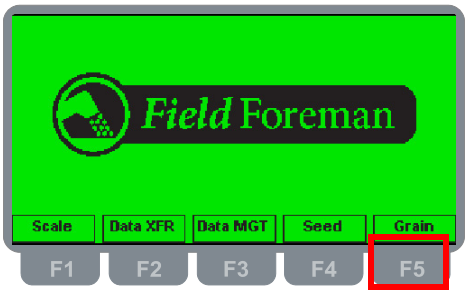


Figure 2.20 Field Foreman Home Screen

2. The ***Harvest Data*** screen will be displayed. From the ***Harvest Data*** screen, add the grain to the cart.

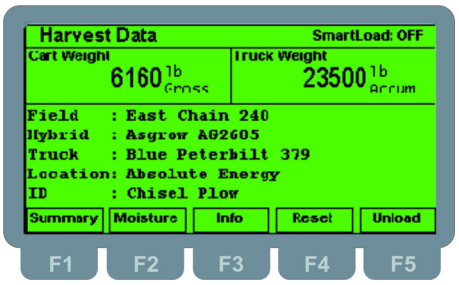


Figure 2.21 Add Grain to Cart

3. The cart and the weight will appear in the *Cart Weight* window. The truck weight on the right starts out as the estimated Truck tare weight. If any grain has been loaded, the truck total will be an estimated tare plus grain loaded. See the example below.

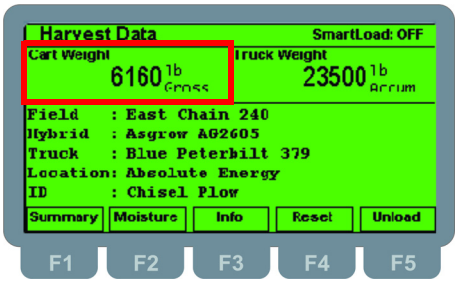


Figure 2.22 Cart Weight Window Example

The screen shown above is the one you use while loading the grain cart from the combine or harvester. There is no data being saved during this process. The screen will show the live grain cart weight.

You can use the weight recorded to compare the grain weight with the grain monitor in the harvester/combine. This can help you calibrate the yield monitor more accurately.

3 Planting Process

This section covers accessing the Planting mode, planting setup and loading a seed tender and planter. Refer to the 2060 User Manual (P/N AWT35-501506) for more details on Planting.

3.1 Access the Planting Mode

1. From the ***Field Foreman*** Home screen, press the **F4/Seed** key.

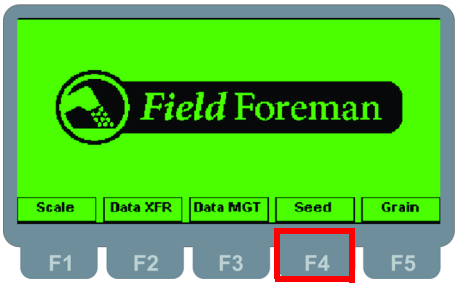


Figure 3.1 Field Foreman Home Screen

2. The ***Planting Data*** screen will be accessed.

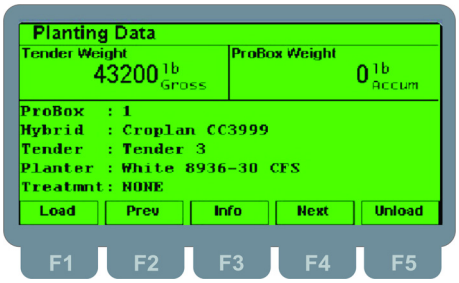


Figure 3.2 Planting Data Screen

3.2 Setup Planting

The following steps will explain how to select all data necessary to load or unload a seed tender.

1. Press the **F3/Info** key from the ***Planting Data*** screen.

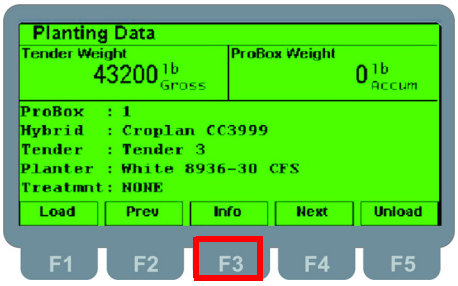


Figure 3.3 The Info Key

2. The ***Planting Info*** screen will be displayed.

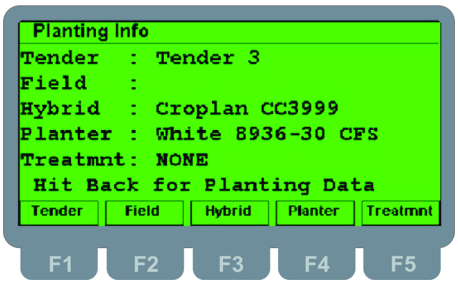


Figure 3.4 Planting Info Screen

3.2.1 Select a Seed Tender (F1)

1. Press **F1/Tender** from the ***Planting Info*** screen.

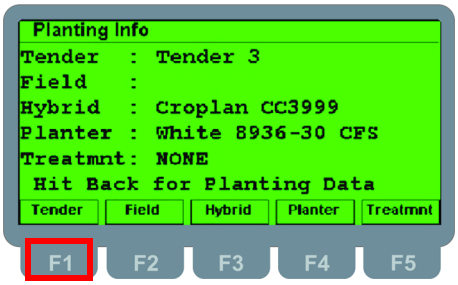


Figure 3.5 Planting Info Screen

2. The ***Tender Selection*** screen will be displayed. Select a tender from the list by using the **F1/▲** or **F2/▼** key.

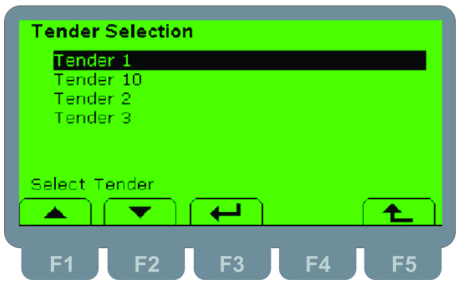


Figure 3.6 Select a Tender

3. Press **F3/** ↵ when the desired tender is highlighted. The ***Planting Info*** screen will be displayed.

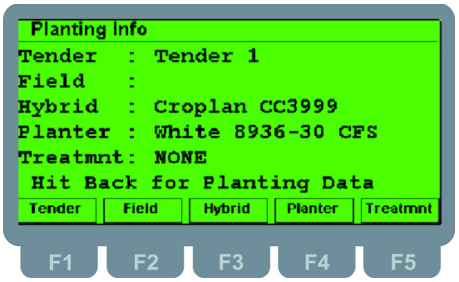


Figure 3.7 Tender is Added

3.2.2 Select a Field (F2)

1. Press **F2/Field** from the ***Planting Info*** screen.

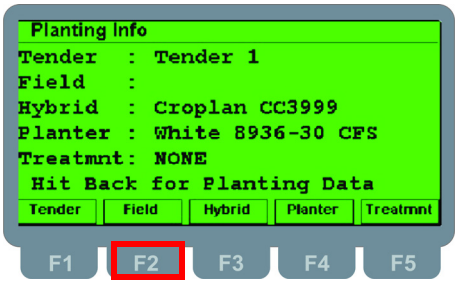


Figure 3.8 Planting Info Screen

2. The ***Field Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

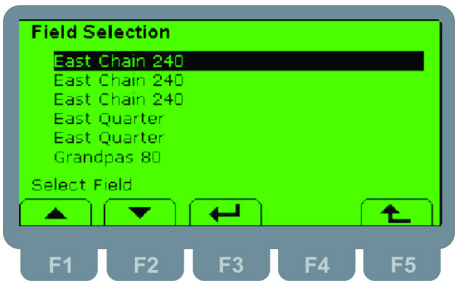


Figure 3.9 Select a Field

3. Press **F3/** ↵ when the desired field is highlighted. The ***Planting Info*** screen will be displayed.

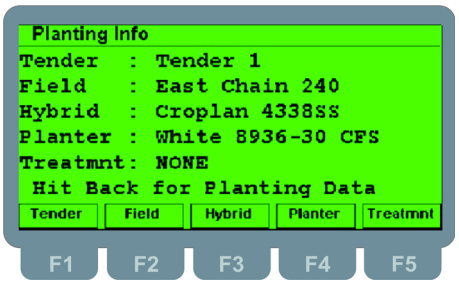


Figure 3.10 Field is Added

3.2.3 Select a Hybrid (F3)

1. Press **F3/Hybrid** from the ***Planting Info*** screen.

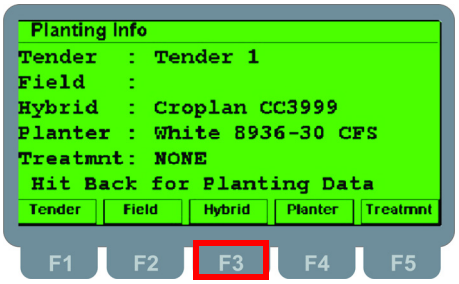


Figure 3.11 Planting Info Screen

2. The ***Hybrid Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

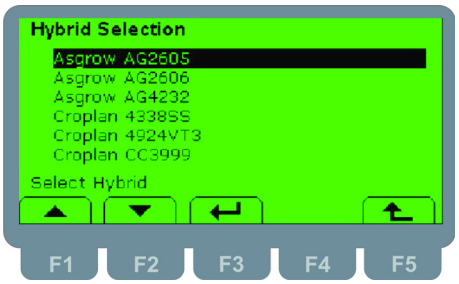


Figure 3.12 Select a Hybrid

3. Press **F3/** ↵ when the desired hybrid is highlighted. The ***Planting Info*** screen will be displayed.

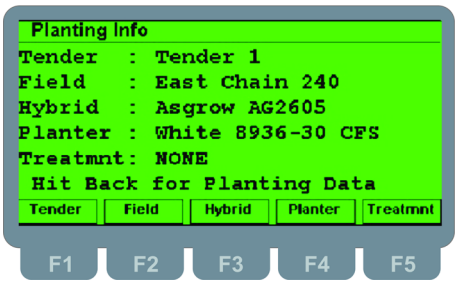


Figure 3.13 Hybrid is Added

3.2.4 Select a Planter (F4)

1. Press **F4/Planter** from the ***Planting Info*** screen.

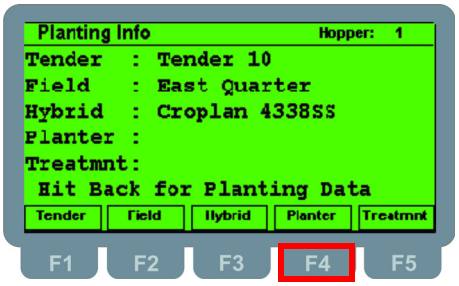


Figure 3.14 Select a Hybrid

2. The ***Planter Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys.

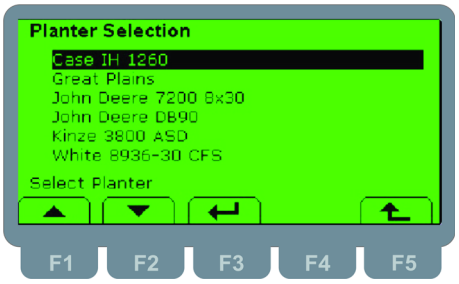


Figure 3.15 Select a Planter

3. Press **F3/** ↵ when the desired planter is highlighted. The ***Planting Info*** screen will be displayed.

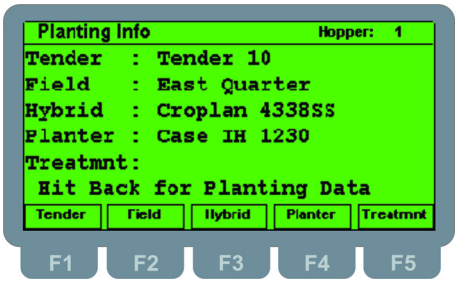


Figure 3.16 Planter is Added

3.2.5 Select a Treatment (F5)

1. Press **F5/Treatment** from the ***Planting Info*** screen.

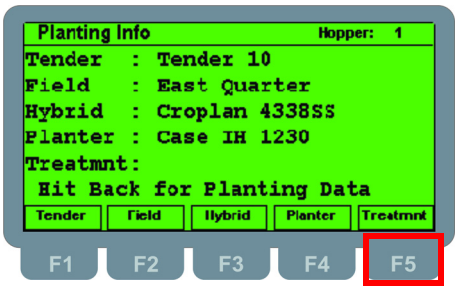


Figure 3.17 Planting Info Screen

2. The ***Treatment Selection*** screen will be displayed. Select a field from the list by using the **F1/▲** or **F2/▼** keys

   If no treatments are being used select *NONE*

   If more than one treatment is being used, pick the first one and press **F3/↵**. Continue to select treatments (up to five) in the same manner. Select *NONE* to end adding treatments.

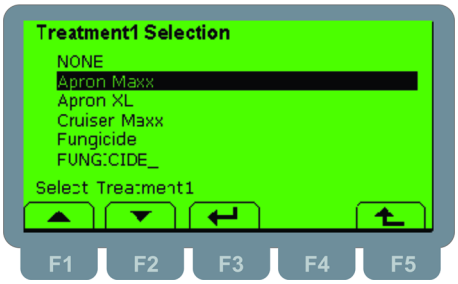


Figure 3.18 Treatment 1

   If only one treatment is being used, press *NONE* for Treatment 2 selection. If a 2nd one is being used select the 2nd treatment and select **F3/↵**.

Figure 3.19 Select a Treatment

3. Press **F3/** ↵ when the desired treatment is highlighted. The ***Planting Info*** screen will be displayed.

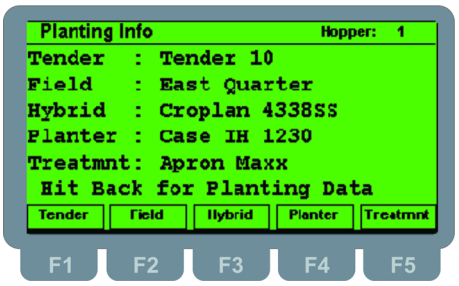


Figure 3.20 Treatment is Added

3.3 Planting Process

Once the data for the first hopper/Probox is selected you are ready to begin loading the seed tender.

3.3.1 Load Seed Tender Individual Hopper

In order to keep accurate records, it is suggested to assign a number to each hopper or Probox location. This example will be based off of a 4 Probox seed tender.

1. Use the **F2/Prev** or **F4/Next** keys to select which Probox you are loading first. You can load in the order that works best for your operation. In this example we will load Probox 1 first.

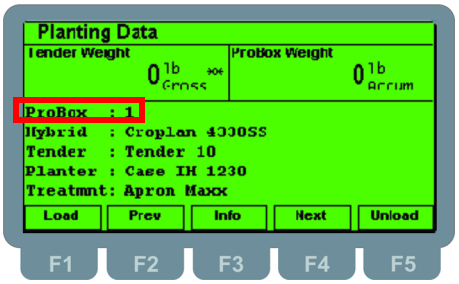


Figure 3.21 Planting Data Screen

Press the **F3/Info** key to select a different Hybrid, Tender, Planter, or Treatment.

2. Press the **F1/Load** key prior to putting the Probox on Seed Tender. Prior to loading hoppers or Proboxes be sure the scale is zeroed.

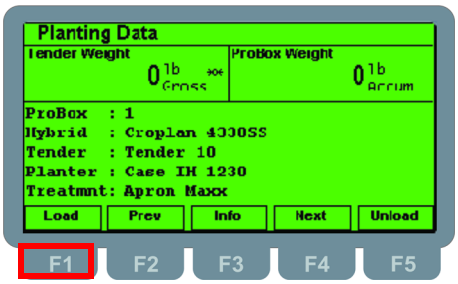


Figure 3.22 Load Hopper / Probox

The user loading Proboxes has two choices to make. They can simply load the Probox and have the Probox container weight show up in the net weight for the Probox or the user can select F5/Reset This will subtract the standard Probox tare weight so the user knows the true weight of the seed.

Currently the default seeds/lb weight is displayed. the user has the option to select F1/Seeds/lb to adjust to the measurement that is on the Probox. Doing this will provide the most accurate seed weight as possible.

3. Press **F1/Seed/lb** to enter in the new seeds/lb and press **F3/** ↵. The new seeds/lb will stay with this Probox until it is reset. The next Probox of this hybrid will go back to the default seeds/lb for that hybrid.

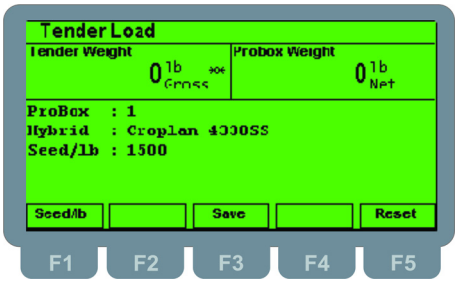


Figure 3.23 Tender Load Screen

4. Set the Probox on the Seed Tender and press **F3/Save**.

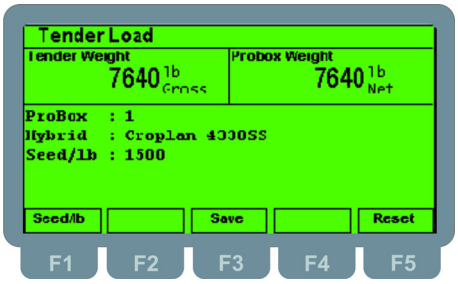


Figure 3.24 1st Probox Loaded

5. Press the **F3/Save** key to save the loaded weight when finished. The weight will show as an accumulated weight under the ***Tender Weight*** portion of the display.

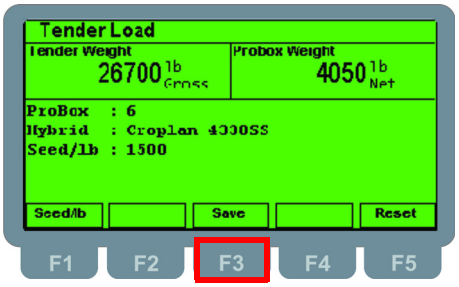


Figure 3.25 Save Loaded Probox

6. Repeat this process to load the other Proboxes.

Reset Net Weight of Hopper

1. Make sure the hopper is empty and press the **F5/Reset** key from the ***Tender Load*** screen.

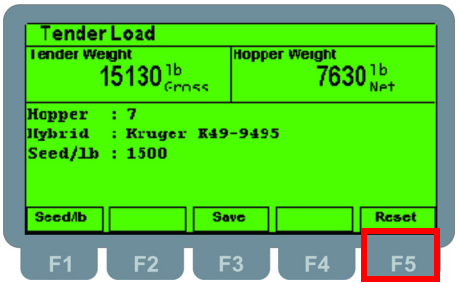


Figure 3.26 Tender Load Screen

2. The Hopper Net weight will be cleared to zero.

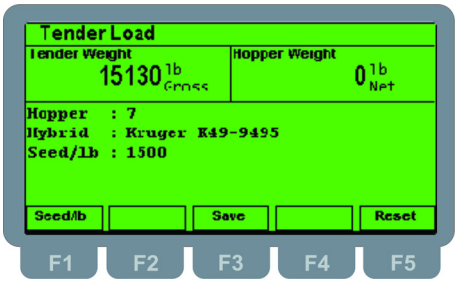


Figure 3.27 Hopper Reset

3.3.2 Load Seed Tender / Probox

1. Use the **F2/Prev** or **F4/Next** keys to select a Probox. The hopper number will change.

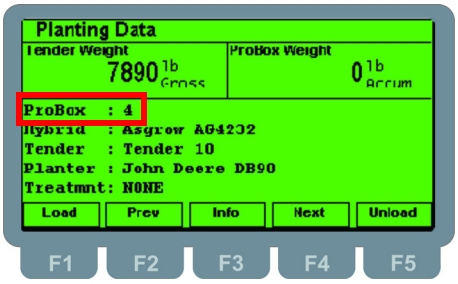


Figure 3.28 Planting Data Screen

Press the **F3/Info** key to select a different Hybrid, Tender, Planter, or Treatment.

2. Press the **F1/Load** key to fill the Probox.

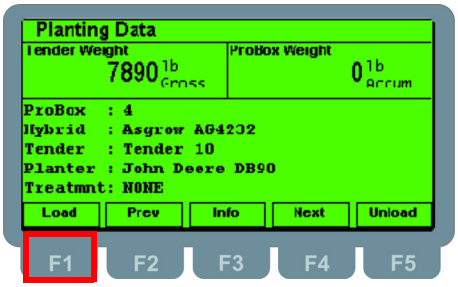


Figure 3.29 Load Probox

3. Load the Probox on the seed tender.

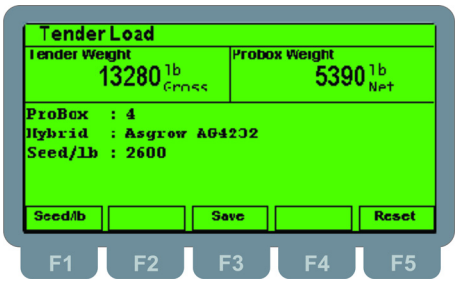


Figure 3.30 Loaded Probox

4. Press the **F3/Save** key to save the loaded weight when finished. The weight will show as an accumulated weight under the ***Tender Weight*** portion of the display.

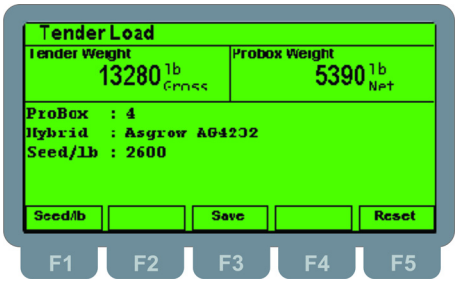


Figure 3.31 Save Loaded Probox

5. Repeat this process for all Proboxes.

Reset Net Weight of Probox

1. Press the **F5/Reset** key from the ***Tender Load*** screen. Refer to section 4.5.3 to set the default Probox tare.

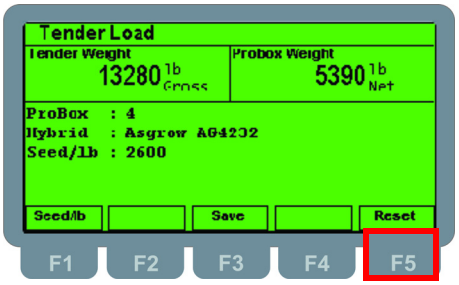


Figure 3.32 Tender Load Screen

2. The tare weight will be subtracted from Probox net giving you a true weight of the seed once the Probox is loaded.

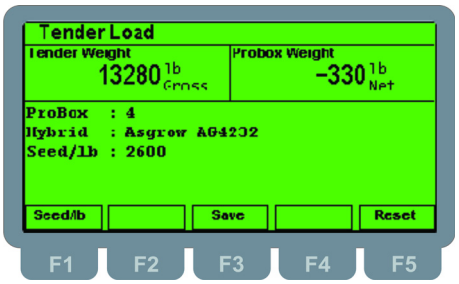


Figure 3.33 Probox Reset

3.4 Fill the Planter

Once the desired Probox/hopper has been loaded you are ready to unload to the planter.

1. Prior to selecting *Unload,* verify the correct field has been selected.

2. Press **F5/Unload** to fill the planter. From this screen you can make additional selections such as field, treatments, planter, etc by pressing the **F3/Info**.

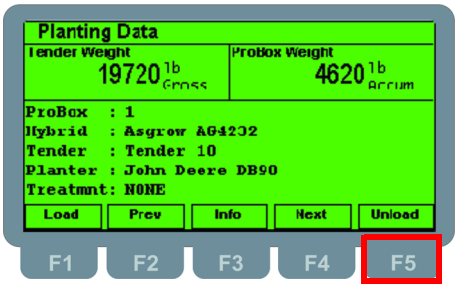


Figure 3.34 Planting Data Screen

3. The ***Tender Unload*** screen will be displayed. From this screen the number of acres, seeds per acre and target can be changed.

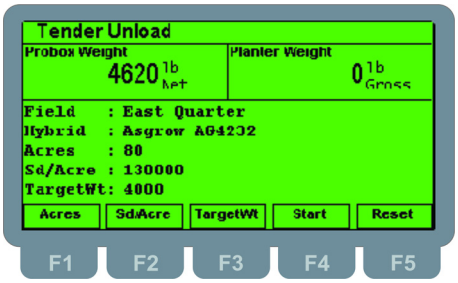


Figure 3.35 Tender Unload Screen

Change Acres

Press the **F1/Acres** key to adjust the acres to plant. Changing acres adjusts the target weight and does not change seeds/acre.

Change the Seeds/Acre

Press the **F2/Sd/Acres** key to adjust the seeds/acre. Adjusting seeds/acre changes the target weight and does not change the acres.

Change Target Weight

Press the **F3/TargetWt** key to adjust the target. Adjusting target weight changes seeds/acre and does not change the acres.

4. Press the **F4/Start** key to fill the selected planter.

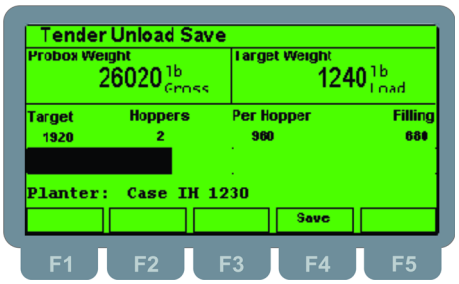


Figure 3.36 Load Seed in Planter

Fill the planter. The target weight will be displayed and will lower as more seed is transfered to the planter. Along with a bargraph which shows how much has been filled and the target value. An alarm light will illuminated when the target value is reached.

If you go over your target that weight will appear as a negative number but will be added onto the total weight of seed in planter.

Central Fill Planter

When filling a CCS planter with two hoppers, the total target will be split evenly between the two hoppers and the alarm light will flash when the alarm%/weight is met and then go solid when target is met.

Hopper Planter

When filling a Hopper planter the target weight will be divided evenly by the number of hoppers. Many times the seed tender can only reach 8 boxes before it has to be moved. In this case the producer will use 3 sets of 8 to fill a 24 row planter.

Note: Often times setting the alarm in pounds instead of % is the most effective pre-alarm setting.

Use of Outputs

Output 1 - Turns on for five seconds when final target is reached. Use for gate.

Output 2 - Turns on for one second when close to target. Use for target achieved light or horn. If exactly two hoppers in the planter, this output is turned on at half of the target and at final target.

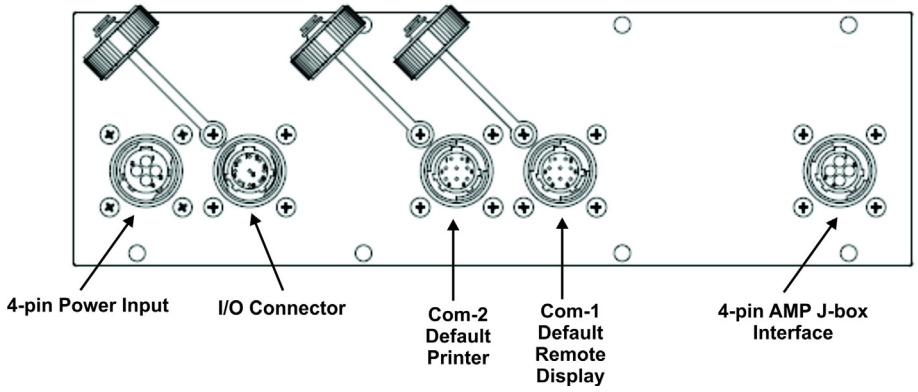
5. Press the **F4/Save** key to save the fill and exit.
6. Continue to load the planter by repeating steps 4 and 5 until loaded. A bargraph will display what has been loaded and what is being filled.
7. Press the **SAVE** key to save the load and exit to the planter fill screen.
8. The **F5/Reset** key will clear the planter net weight.
9. Press the **BACK** key to exit the planter fill mode. The ***Planting Data*** screen will be displayed.

4 Cable Connections and Power Requirements

Voltage to the Model 2060 must be 10-36 volts DC, negative ground only. Dropping below eight volts will cause the Model 2060 to automatically shut itself off, protecting the battery from being completely drained.

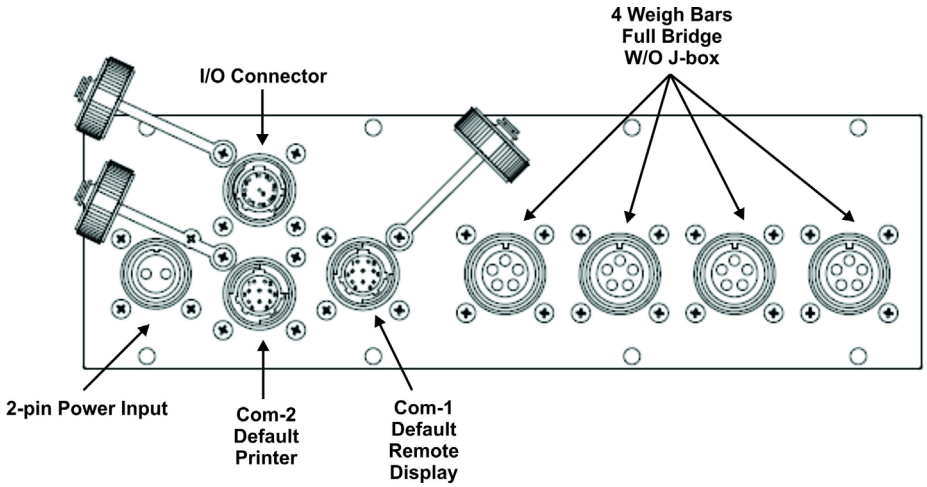
4.1 AWT05-508280 4+ Pin Amp Bottom Plate

This model has 4-pin power, Input/Output, printer, remote display and J-box home run cable connector.



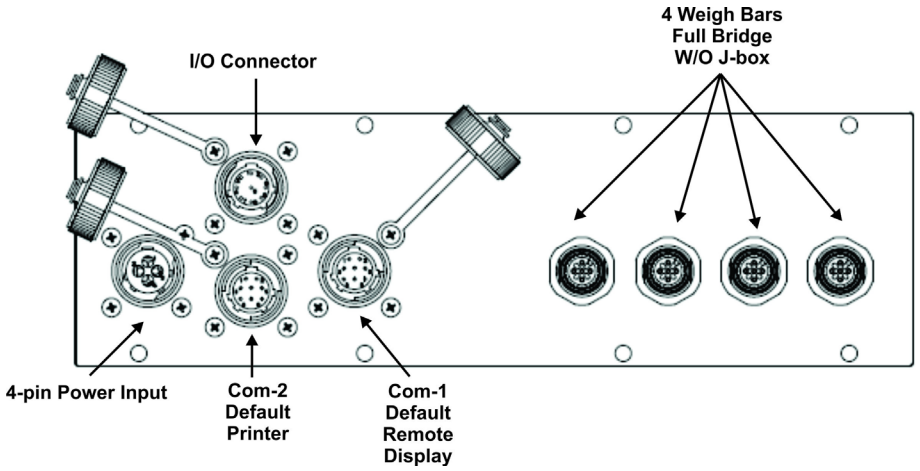
4.2 AWT05-508300 4x 5Pin AWT Bottom Plate

This model has 2-pin power, Input/Output, printer, remote display and input for 4 different weigh bars or J-box home run cable connector.



4.3 AWT05-508284 4x EzMate Bottom Plate

This model has 4-pin power, Input/Output, printer, remote display and input for 4 different weigh bars or J-box home run cable connector



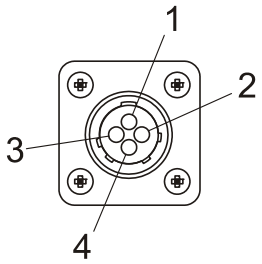
4.4 Routing the Scale Interface Cable

The scale interface cable is the cable that runs from the junction box (j-box) to the indicator.

For the AWT05-508280 Single Amp you will need to use a J-box.

For the AWT05-508284 4x EzMate and AWT05-508300 4 by 5-pin AWT you will only need to use a j-box for systems with 5 or more weigh bars.

1. Loosely connect the scale interface cable to the **SCALE** connector on the indicator.



Scale Connector

Pin	Description
1	+ Excitation
2	- Bridge
3	+ Bridge
4	- Excitation

Figure 4.1 Scale Connector

2. Run the cable from the indicator to the junction box, allowing some slack in the cable.
3. Connect the other end of the scale interface cable to the junction box.
4. Inspect the cable run and make sure that the cable is not pinched, kinked or in the way of moving parts or sharp objects.

5. AWT05-508300 2-pin AWT 4 by 5-pin AWT Be sure to allow some slack when zip tyeing or tucking away the cable.
6. Tighten the connector at the indicator.

4.5 Connecting to a Convenience Outlet

If the equipment you are using has an Auxiliary Power Outlet Strip it is preferred to supply power to the indicator from the outlet strip rather than the battery.

Most power strip outlets have spades that provide constant power (unswitched power) or key-switched power. Decide which one works best for your application and identify which spades provide this power type.

If you have a tinned lead power supply and want to connect to the auxiliary power you need to add a spade to each wire.

- Connect the white wire to the key-switched or unswitched power spade.
- Connect the black wire to the ground spade.

4.6 Wiring 2060 Indicator to Equipment Power Systems

In all cases it is advised that you consult the equipment manufacturer or authorized agents for advice before installing a weighing system. These are configurations that you may find on different equipment manufacturers models.

Note that the electrical connection to the metal work of the equipment is shown by the following symbol:

ENSURE THAT YOU DO NOT SHORT CIRCUIT THE BATTERY; SPARKS AND ARCING FROM A BATTERY SHORT CIRCUIT CAN CAUSE SEVERE BURNS.

- Always connect to the supply battery terminal last.
- Complete the wiring to the weighing indicator before connecting to the indicator. Check with a resistance meter to insure there is no connection between the supply wire and chassis ground.
- Verify battery system you are connecting to has negative ground.
- When you are satisfied with the above connect to the battery supply.

4.6.1 12 Volt Power Systems (one and two 12 V batteries)

Single Battery

12 V Battery negative terminal ground connection +12V power supply. **DO NOT REVERSE THE POLARITY!**

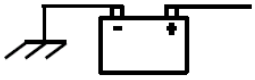


Figure 4.2 Single Battery Connection

Two 12 Volt Batteries Wired in Series

Center ground connection +12V power supply

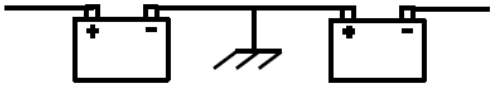


Figure 4.3 Two 12 Volt Battery Connection

4.6.2 24 Volt Power Systems

The negative terminal connection of the first battery connected to ground, +ve connection wired to the negative terminal of the second battery, the +ve is the +24V power supply. **DO NOT REVERSE THE POLORITY!**

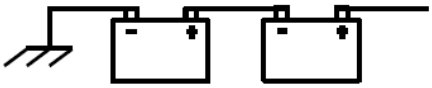


Figure 4.4 24 Volt Battery Connection

4.6.3 Grounded Power Systems

Ground battery connection means that one terminal of the battery is connected to the equipment metal chassis. The current returns to the battery through the metal work of the equipment chassis.

If the power system used is not connected to the chassis ground and is electrically isolated from other equipment then this should not cause any problems with weighing indicators. Normally the indicator is connected to the equipment power supply using one of the grounded power systems described above.

Problems Using Chassis Ground

If the mating parts of the chassis are corroded then the resistance can be high which depending on the current flow may reduce the voltage available to drive accessories.

There may be high power devices such as lights or motors which when switched on or off because they share the current path could cause the voltage available to drive accessories to be electrically noisy. In the case of motors then they can cause very high voltage spikes which could damage accessories.

Grounding Weight Indicators

For weighing indicators it is advised that the one of the power supply inputs is connected to the equipment ground battery terminal through a separate insulated wire.

The separate return wire reduces the risk of chassis corrosion problems and over voltage caused by other equipment electrical systems.

The ground connection ensures that the current flow in the indicator power wires is always in the same direction, so that the built in circuit protection is effective.

If the system described in section 4.6.2 is used then there is available a 12V power connection between 12V and 24 V. If this is used as a 12V power supply connection the following problems could occur;

- On some indicators the metal housing of the indicator is connected to one of the power connections the 12V from the ground connection. If there is an accidental connection from the indicator housing to the equipment metal work then there will be a large fault current which will cause the power cable 0V wire to heat up.
- The internal power surge protection in the indicator which protects it, the weigh bars and other components such as external displays will not be effective against over voltages with respect to the ground. This could lead to damage of the weigh bars which are connected by their load connections to the ground although internally electrically isolated. Other accessories such as the external displays, which have metal housings, may also be damaged if there is a high voltage between the power supply and housing.

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