FIELD REFERENCE GUIDE

CLASSIC GRAIN GAGE

HarvestMaster™

Field Research Software™

Classic GrainGage™

Reference Guide

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CHAPTER 1

GETTING STARTED WITH FRS SOFTWARE

Downloading and Installing FRS

Downloading and Installing Harvest Modules

FRS Software for Allegro MX

Removing and Installing Latest Version of FRS and Related Firmware

Replacing the original script files:

Updating Datalink for FRS

GETTING STARTED WITH FRS SOFTWARE

Designed by seed researchers, Field Research Software™ (FRS) helps seed researchers and agriculture scientists perform data collection tasks on research plots.

The Classic GrainGage™ is employed on combines to record weight, moisture, and test weight on grains. It aids research scientists by automating data collection. This Field Reference Guide helps you through setup, calibration, and harvest with the Classic GrainGage.

This guide also outlines the operation of the Field Research Software Harvest module. The FRS Harvest module is a component of the FRS Note Taking™ application. This Field Reference Guide assumes the user is familiar with the operation of FRS Note Taking. For more information, see the FRS Note Taking Field Reference Guide.

FRS software is designed so you can either select on the touch screen with a stylus or use the keyboard. Function keys, arrow keys, the Enter key, and the Tab key are designed to help you move the cursor through the software and make selections.

Figure 1-1: Classic Grain Gage

Downloading and Installing FRS

1. Go to http://www.harvestmaster.com/HarvestMaster/support/Downloads/FRS-Suite.
2. Download FRS Note Taking, making sure you select the correct version of the software for your handheld OS (ex. CX vs. MX).
3. Make an Activesync (XP) or Mobile Device Center (Vista/Win 7) connection between your handheld and PC.
4. Run FRS Note Taking setup on PC.
5. Choose installation location on PC.
6. Choose "Yes" to allow program to install in default location on handheld.
7. Give it a minute or two to download onto your handheld.
8. Run FRS on handheld.

9. Enter name and previously obtained serial number and registration key.

Downloading and Installing Harvest Modules

1. Go to http://www.harvestmaster.com/HarvestMaster/support/Downloads/FRS-Suite.
2. Download CAB file associated with your harvest module and correct handheld OS (example: 400 vs. 800 and CX vs. MX).
3. Make an Activesync (XP) or Mobile Device Center (Vista/ Win 7) connection between your handheld and PC.
4. Click Explore (XP) / File Management (Vista/ Win 7).
5. Click and drag the CAB file from the PC to the handheld to a location that you can find later with File Explorer.
6. Allow file to convert to handheld format.
7. Run file on handheld.
8. Install to ***Device***.

FRS Software for Allegro MX

Important notes

The process of updating FRS will erase all data associated with the current installation of FRS on the handheld. Please review the items in this section to understand which data is at risk and be sure to make backup copies so that you can restore files that are critical to your FRS setup. Please review the RELEASE NOTES associated with the latest software version located on the HarvestMaster website. These notes will recommend optimal settings and instructions to maximize the efficiency of your Harvest Data System.

This update will:

- Remove all existing versions of FRS stored on your handheld.
- Remove the FRS database on the handheld. This includes field maps, customized trait list, trait templates, and other associated data. This data needs to be exported and saved so that they can be imported back into FRS after the new software is installed.
- Erase special harvest script files (GHM, Kincaid air diverter, Wintersteiger subsampler, etc.). These instructions will guide you through how to either download the latest script file or save your original script files and import them into the newest version of FRS.

- Erase the harvest calibrations and handheld settings, including load cell coefficients, chamber volumes, actuator settings, level detect sensor settings, timers, and moisture curves. In order to avoid having to recalibrate after the update, be sure to record the current harvest calibrations and handheld settings so that they can be entered in FRS after the update.

Requirements

- Original FRS Note Taking serial number and registration codes found on the back of CD case or laminated card sent at the time of purchase.
- Allegro MX Field PC
- Microsoft ActiveSync (for Windows XP) or Windows Mobile Device Center (for Windows Vista)
- Either a Power Dock (recommended) or a USB-to-mini-USB cable ActiveSync/Mobile Device Center connection to PC

Saving your original script file

1. Go to *Start > Programs > File Explorer.*
2. Go to ***My Device > Program Files > FRS***.
3. Go into your Harvest Module's folder.

Figure 1-2: Classic GG script screen

4. Hold Ctrl on the handheld keyboard and tap once on the appropriate text files to high-light them.
5. Click ***Menu > Edit > Copy.***
6. Go back to ***My Device*** and go to ***Storage***.
7. Tap on ***Menu > Edit > Paste***.

Removing and Installing Latest Version of FRS and Related Firmware

Removing FRS and Firmware on Handheld

1. Tap on ***Start > Settings > System Tab***.
2. Scroll down and select ***Remove Programs***.

Figure 1-3: Remove Programs icon

3. Choose to remove your Harvest Module.

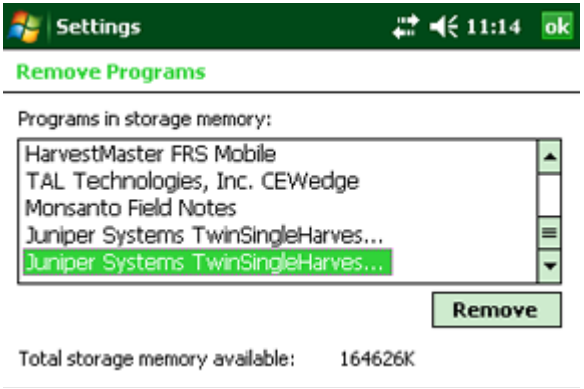


Figure 1-4: Remove Programs screen

4. Confirm your intention to remove the program.
5. Choose to remove FRS.
6. Confirm your intention to remove the program.

7. Choose to remove all application data.
8. Tap on ***Start > File Explorer > Program Files***.
9. Scroll down and highlight FRS.

Figure 1-5: Highlight FRS

10. Click ***Menu***, and delete FRS folder.
11. Choose ***Yes*** to whatever questions it asks about removing files.

Now you can download new software onto the handheld. Follow the instructions for downloading new software at the beginning of this chapter .

Replacing the original script files:

If there are no updated script files specified in the release notes,you can now copy/paste the original script files from the storage folder into the new harvest module folder. .

1. On the handheld, go to Start > Programs > File Explorer
2. Go to My Device > Storage
3. Hold Ctrl on the handheld's keyboard and click all the text files there.
4. Click Menu > Edit > Cut
5. Go to My Device > Program Files > FRS
6. Go into your Harvest Module's folder
7. Click Menu > Edit > Paste and answer yes when prompted.

If there are updated script files, download them from the website and paste them into your harvest module folder as previously instructed from steps five to seven.

HM-800 Users:

- For HM-800 Systems, the firmware must be manually updated using a utility on the handheld. Follow the steps below to complete the HM-800 update.
- Using both the battery with a full charge and the external power cord is ideal before updating the firmware. Also make sure the auto suspend is disabled on the handheld. (***Start>Settings>System>Power>Advanced***)If you do not

have an external power cord, you can use the Console charge cord. Failure to power the Allegro during the full firmware update process could lock the Console module.

Updating HM-800 Firmware

1. Connect handheld to HDS.
2. Select ***Start > File Explorer > My Device > Program Files > FRS > Firmware***.
3. Run ***HM-800 Updater***.

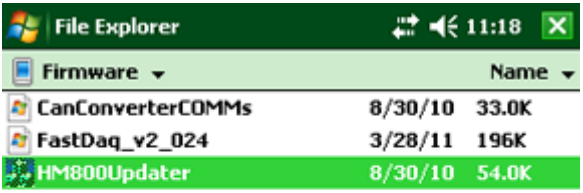


Figure 1-6: Select HM-800 Updater

4. Choose the file that contains the updated information.

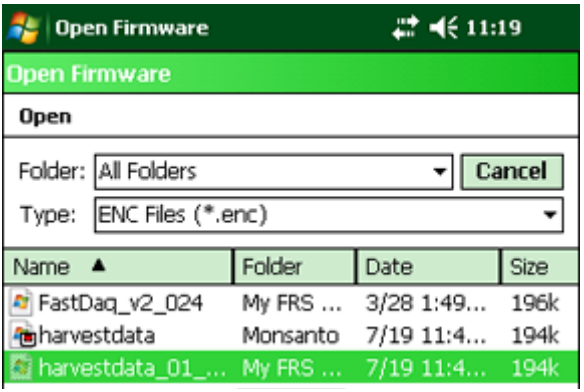


Figure 1-7: Select .enc file

5. Select the module you wish to update.

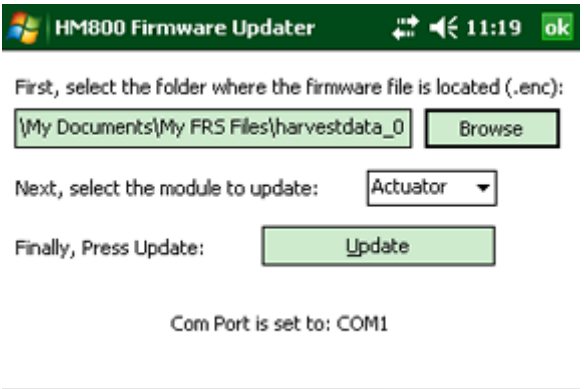


Figure 1-8: Select module to update

6. Click on Update and it will show the current firmware version installed and give you the option of continuing.
7. If the versions do not match and the current firmware

version is older than the new firmware version, select ***Yes.***

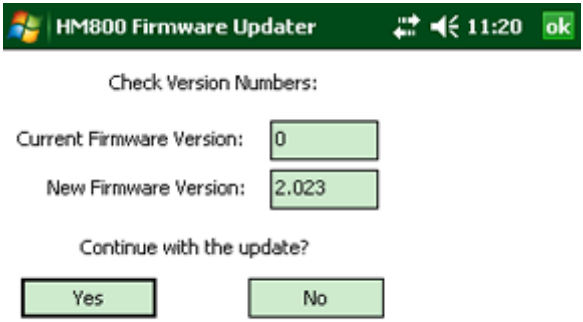


Figure 1-9: Select* Yes *to continue

8. Continue the firmware update for all HM-800 modules.

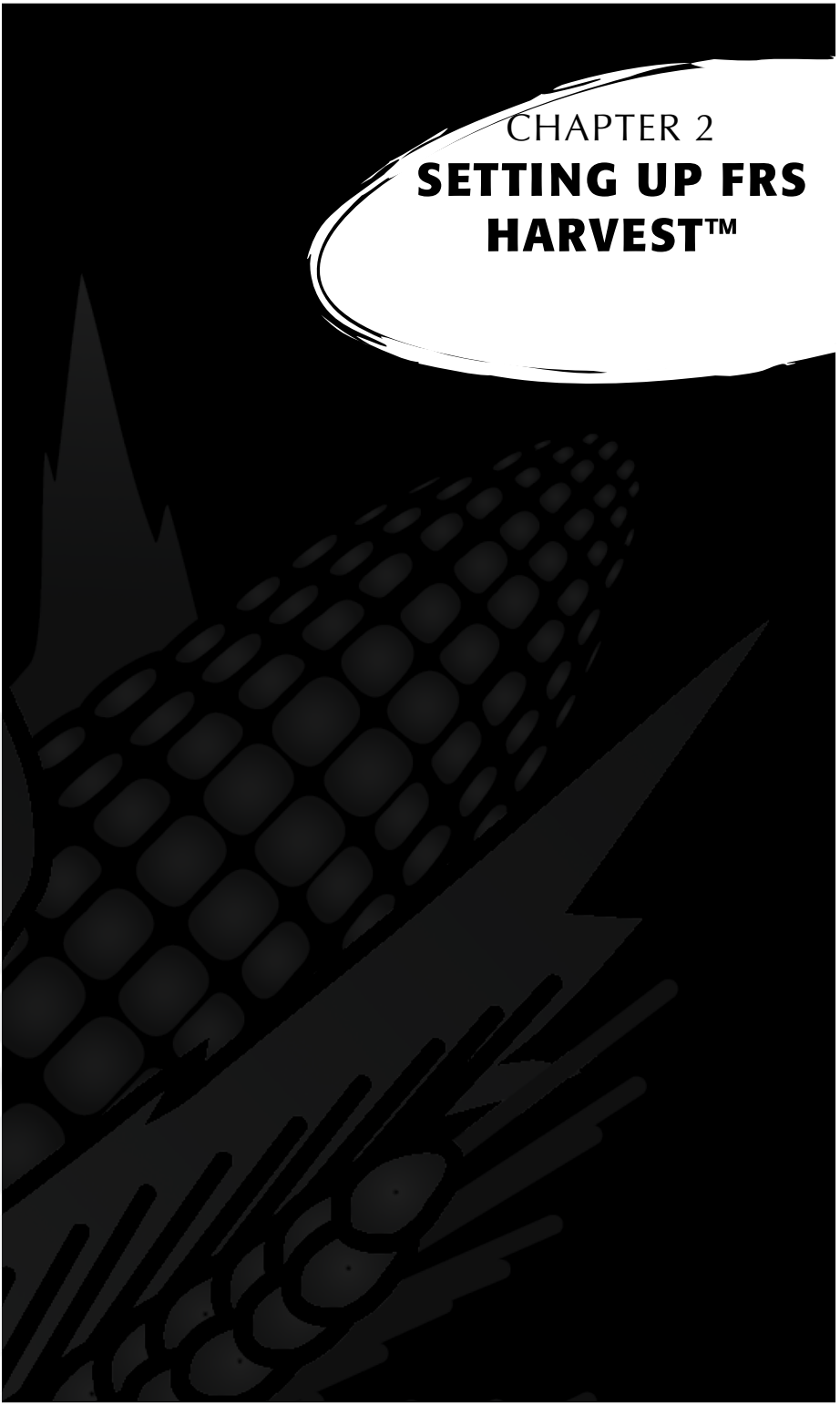
When the firmware update is complete, open FRS and type in your calibration settings that were previously recorded. If you never changed the transition timers on the actuators, we recommend leaving them at default to speed up operation. Verify the calibration and operation of the system. You will also need to import any data that you exported earlier such as maps, customized trait list, trait templates, existing data, etc. Refer to chapter 7 of the FRS Field Reference Guide: Note Taking manual for further instructions on importing and exporting files.

Updating Datalink for FRS

1. First, you will need to uninstall the original version of Datalink for FRS from your PC.
2. After uninstalling the original Datalink for FRS, visit http://www.harvestmaster.com/updates and download the latest version of Datalink for FRS.
3. Run and install this latest version and your Datalink for FRS will be updated and compatible with the latest FRS version.

CHAPTER 2

SETTING UP FRS HARVEST™



Setting Up FRS *Harvest*™

Follow these steps to enable your Classic GrainGage to work with FRS ***Harvest.***

1. Make sure the cables between the GrainGage and the handheld are set up properly so the software and hardware can communicate. For details about cable placement, see ***Appendix C: Cable Wiring for the HM-800.***
2. From the Main FRS Screen, select **Setup** (F3).

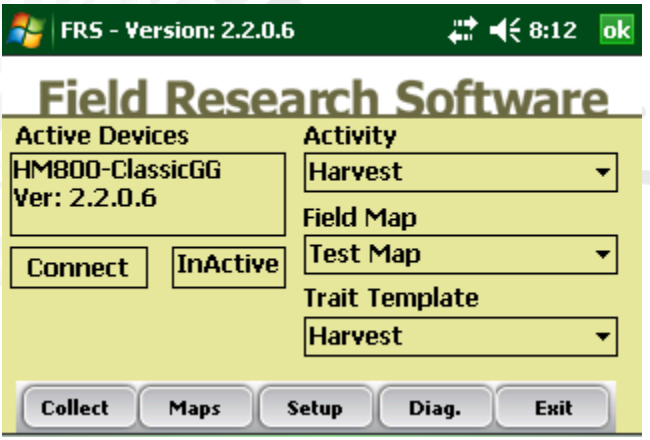


Figure 2-1: Choose* Setup *on the Main FRS Screen

3. The Setup menu appears. Tap the plus sign [+] next to ***System*** or use the right arrow to expand the System option.

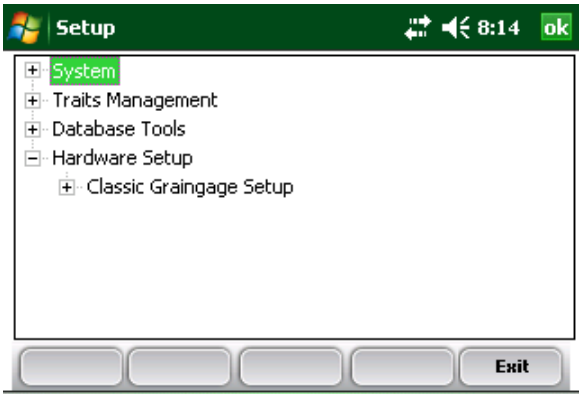


Figure 2-2: Setup menu

4. Select ***Manage Devices*** either by double-tapping it or by using the up or down arrow keys and pressing the Enter key.

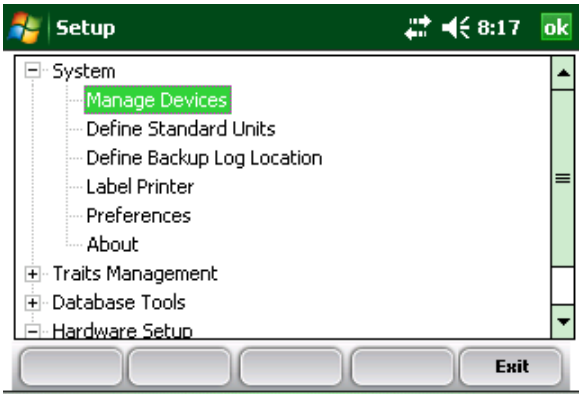


Figure 2-3: Setup menu with Manage Devices selected

5. In the Devices screen shown below, enable the Classic GrainGage by tapping on the appropriate check box. You can also highlight the desired module using the navigation arrows and press the spacebar to check the box.

Note: Only one device can be enabled at a time.

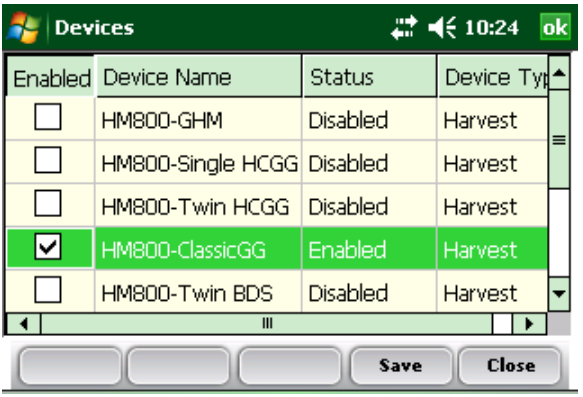


Figure 2-4: Devices screen showing the Classic as enabled

6. Press ***Save*** (F4). The software begins to load and checks to see if hardware devices are connected. Wait until the software has finished loading before proceeding to the next chapter.

7. Press ***Exit*** (F5),

FRS software has an emulation mode to allow software familiarization without being connected to a hardware device.

CHAPTER 3

CALIBRATING AND PREPARING FOR HARVEST

Weight Calibration

Moisture Sensor

Chamber Volume

Level Sensor

Timers

Actuators

Setup File

Calibrating and Preparing the Classic GrainGage for Harvest

This chapter explains how to calibrate and set up your Classic GrainGage to work with FRS Harvest. The sections below describe the first- and second-level menu options in the Setup menu under ***Classic Graingage Setup***.

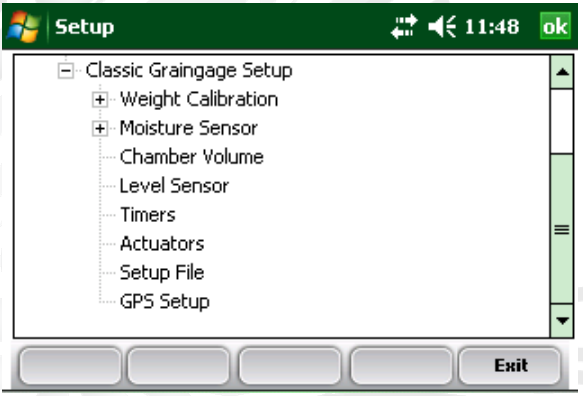


Figure 3-1: This chapter explains the options under Classic Graingage Setup in the Setup menu

To verify weight calibrations.

In diagnostics, select **Load Cell**. Place known weight of approximately five pounds on the weigh pan as close to the center of the weigh pan as possible. Record weigh reading and if different from known weight, follow the following steps to recalibrate weight reading.

1. Select the units you wish to use by going to ***Setup > System > Define Standard Units***. Select English or metric units.
2. From the main FRS screen, select ***Setup*** (F3) > ***Hardware Setup > Classic Graingage > Weight calibration > Edit Weight Calibration.***

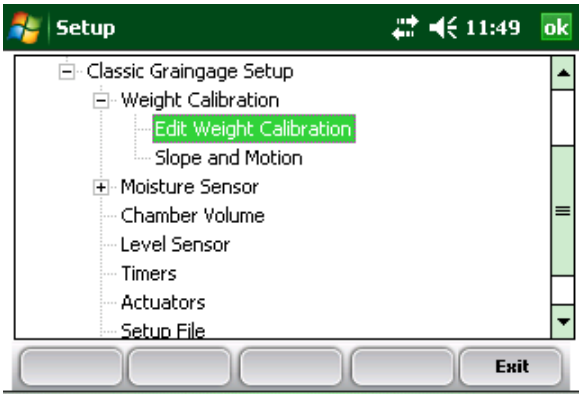


Figure 3-2: Setup screen with Edit Weight Calibration

3. Record Weight Calibration Coefficient value.

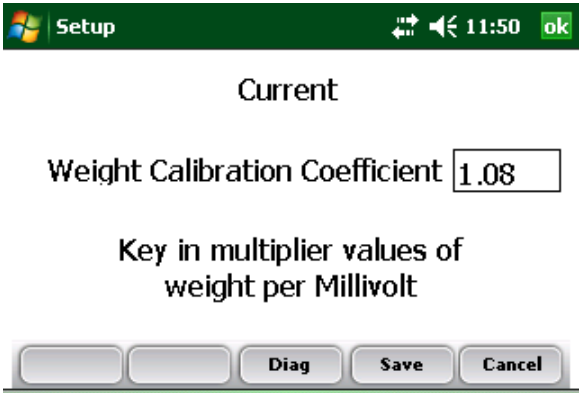


Figure 3-3: Edit Weight Calibration screen

4. Adjust the weight calibration using the following equations.

New Weight Cal Coefficient =
Actual Weight/Measured Weight * Current Coefficient

Example: 5.187 lb./9.63 lb. * 1.08 = 1.083

   a. Replace the current Weight Calibration Coefficient with the calculated value.

   b. In diagnostics from the main screen select Load Cell and Tare weight.

   c. Place known weight on weigh pan where it was placed previously and verify weight reading being displayed.

Note: Typical coefficient for HM-800 is 1.08

Slope and Motion

The Slope and Motion Sensor refers to patented technology used to eliminate errors created by combine vibrations. The sensor lets you collect weight readings while the combine is in motion. To set the sensor, follow these steps:

1. From the Setup menu, select ***Hardware Setup*** > ***Classic Graingage Setup*** > ***Weight Calibration,*** then arrow down or select ***Slope and Motion.***

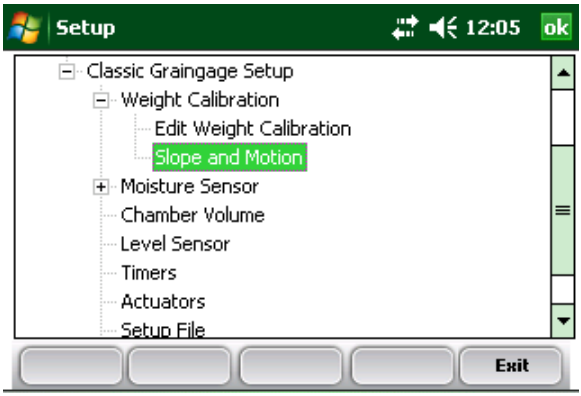


Figure 3-4: Setup menu with Slope and Motion selected

2. Select ***Internal*** to enable the Slope and Motion Sensor. Wait 10 seconds until the ON/OFF label in the center of the screen changes to **ON.**

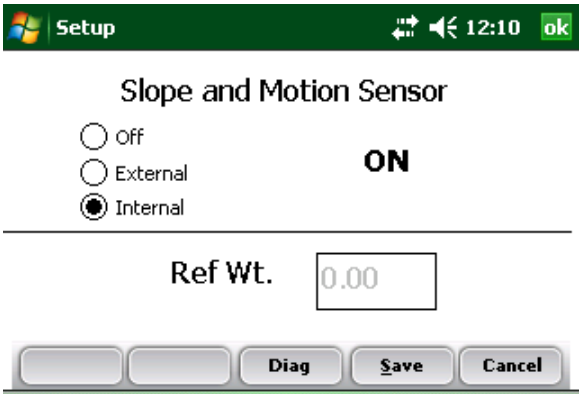


Figure 3-5 Slope and Motion screen with* Internal *selected

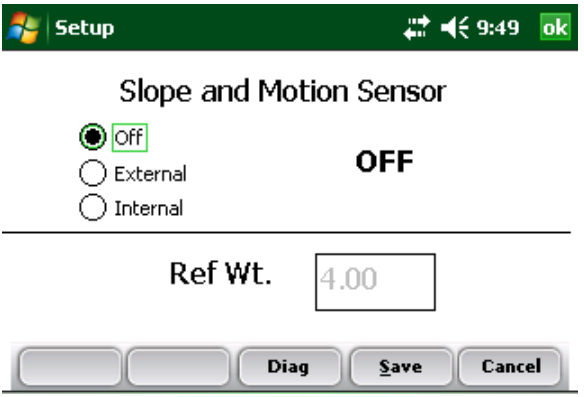


Figure 3-6: Slope and Motion screen with* Off *selected

To disable the Slope and Motion Sensor, select Off then press Save (F4).

Moisture Sensor

The Classic GrainGage system uses the EM Grain Moisture sensor for moisture. To view or modify the moisture curves select ***Moisture Sensor: Moisture Curve.***

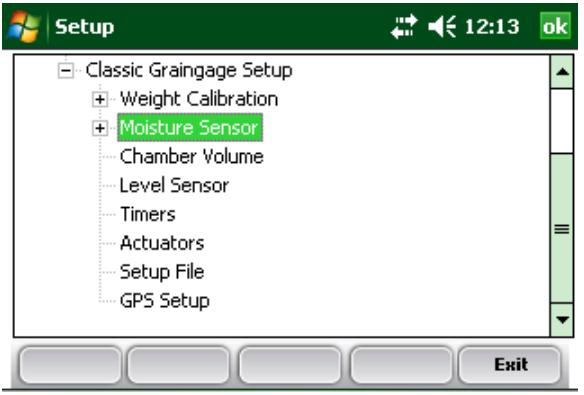


Figure 3-7: Setup screen with EM Sensor option selected

Moisture Curve

Editing a moisture curve

To edit a moisture curve, follow these steps:

Select ***Setup*** (F3) > ***Hardware Setup*** > ***Classic Graingage Setup*** > ***EM Sensor*** > ***Moisture curve.***

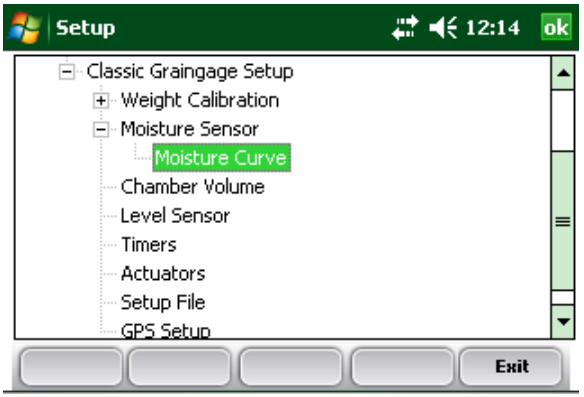


Figure 3-8: Setup screen with Moisture Curve screen highlighted

The Moisture Curve screen appears, listing any existing moisture curves and giving you the option to edit, delete, or copy moisture curves. Each of these actions is described in more detail below.

Note: The check mark next to one of the curves indicates the curve most recently used.

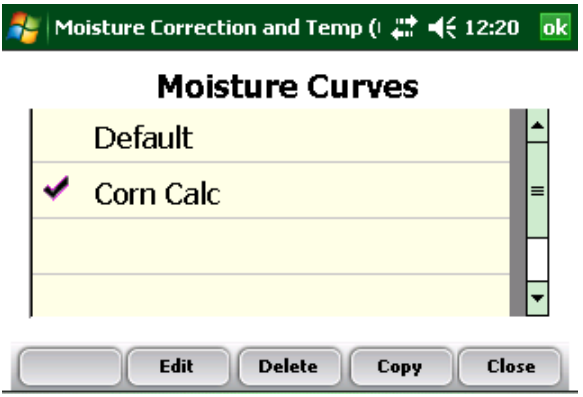


Figure 3-9: Moisture Calibration main screen

1. The Moisture Calibration screen lists all moisture curves that have been created. One of the curves is a ***Default*** grain moisture sensor curve that comes with FRS. It can be copied but not modified. The default curve consists of a set of known data points, which the system uses when making the moisture measurement on a sample of grain. When plotted in a spreadsheet, the default curve appears like the graph (see Figure 3-10).

Default Moisture Curve for EM Sensor

Moist %	MV
0.00%	0.00
10.00%	1.22
13.00%	1.61
16.00%	1.93
19.00%	2.19
22.00%	2.41
25.00%	2.60
28.00%	2.77
31.00%	2.93
34.00%	3.07
37.00%	3.19
40.00%	3.30

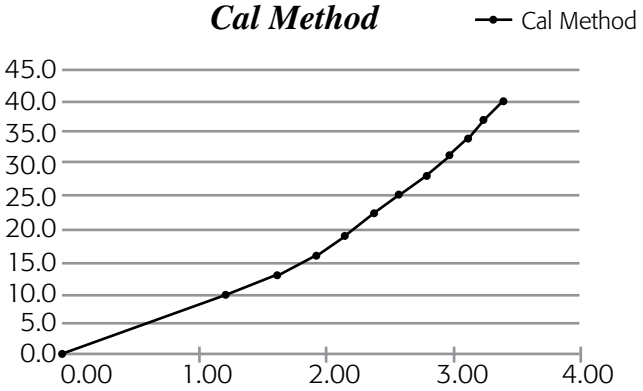


Figure 3-10: Default moisture curve as it appears in a spreadsheet (top) and as it appears in a graph (bottom)

To check moisture choose ***Diags*** (F4) on the main FRS screen.

1. Select ***Moisture.*** Record the Rel Vlts and the Moisture (%) from each sample that has been cycled through the grain gage. Compare the Moisture (%) reading with a known percent moisture from a standard.

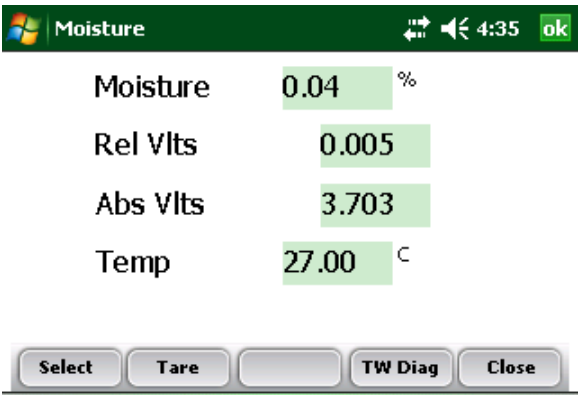


Figure 3-11: Diagnostics Moisture screen

2. Adjust the moisture curve by adjusting individual points in the curve. The following sections explain how to make adjustments to individual points, how to adjust the moisture grain temperature, how to delete a curve, and how to copy a curve.

Note: We recommend creating a different moisture curve for each different grain type. A custom spreadsheet to aid in adjusting your moisture calibration can be found on the Juniper Systems web site. This spreadsheet helps you adjust the points on the moisture curve to match your system.

To access the spreadsheet, go to ***www.harvestmaster.com*** and choose ***Support*** > ***Knowledge Base***. From there, select

Moisture Sensor. Choose the link called HM-800 EM Sensor Moisture Curve Calculator (with suggested curves) to view the spreadsheet.

Moisture Calibration/Adjustment

Before re-calibrating the moisture curve, it is important to note that a simple check of the EM sensor readings is all that may be required. Simply dump a few known samples through the system and verify the readings. If the readings are within specifications, no further calibration is needed. However, if the readings significantly differ from a bench top moisture analyzer, the following calibration may be necessary.

Two known samples at ambient temperatures will help start the calibration process. Test these samples on a bench top moisture analyzer and record the readings. A sample with a moisture range of 12-15% and a sample from 23-26% will perform the best with the EM sensor.

NOTE: Do not use "re-wet" or "water-added" samples for the calibration process. The physical characteristics of "re-wet" corn are significantly different than freshly harvested or naturally drying field corn and can adversely affect readings from the EM sensor. Storage of grain samples should be in unsealed containers to prevent the collection of surface moistures. It is also important to note that when you are dumping samples through the system, you cycle the grain through the system as it would during normal harvest conditions. For example, if there are holding hoppers present, use the holding hoppers to dump the grain into the system.

1. Navigate to the moisture diagnostics menu and record the temperature reading from an empty bucket.

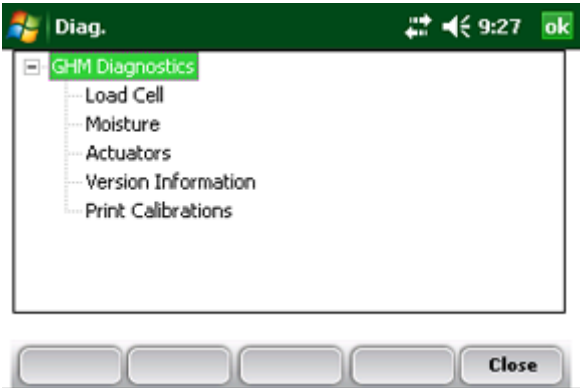


Figure 3-12: Diagnostics Menu screen

2. Dump the first sample into the system and record the REL volts.
3. Retrieve the first sample from the system for later use.
4. Dump the second grain sample into the system and record the REL volts for the second sample.
5. Retrieve second sample for later use.
6. Now that you have your readings from the HarvestMaster system, follow the instructions for the HarvestMaster moisture calibration spreadsheet located on our website at http://www.harvestmaster.com/HarvestMaster/support/Knowledge-Base.
7. Enter the moisture readings from your bench top moisture analyzer into the yellow column for moisture.
8. Enter the REL volts for both samples into the yellow column for volts.

9. Enter the temperature reading from the empty bucket into the yellow box for calibration temp.

Your new curve should now automatically generate. See **EM Grain Sensor Moisture Curve Calculator** following this section.

10. Once the new curve has been generated, create a new moisture curve in FRS and enter the values from the spreadsheet (***Setup>GGSystem>MoistureCurve***).

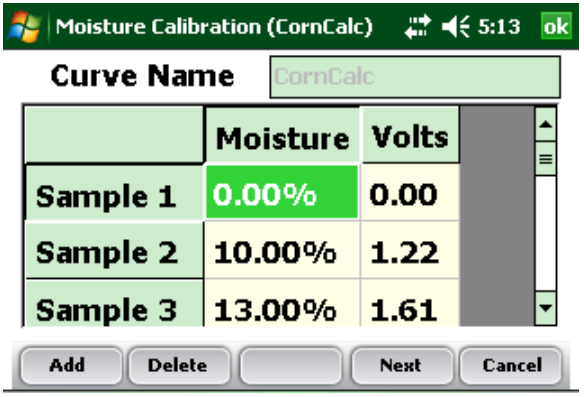


Figure 3-13: Moisture curve view

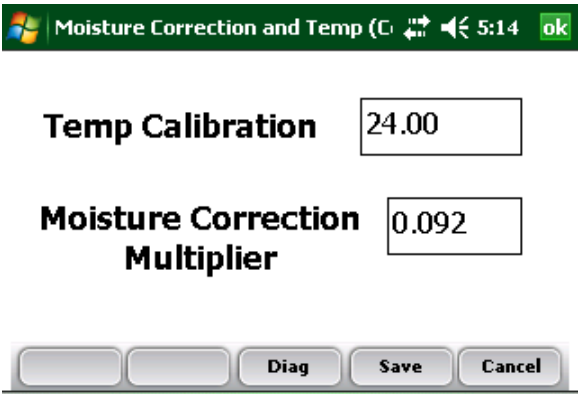


Figure 3-14: Temp compensation screen.

11. Save the new curve. Dump the samples back through the system to verify the readings. We also suggest dumping three to five samples of different moistures to verify readings throughout a moisture range that you may encounter during harvest. You have now successfully calibrated your EM sensor!

EM Grain Sensor Moisture Curve Calculator

Instructions:

1. In the grain moisture diagnostics screen, with an empty chamber, activate the tare process.

2. Cycle a known moisture DRY grain sample (e.g. 12% to 15% for corn) into the moisture sensor chamber. Write down the known moisture value AND the "Rel Vlts" value. DO NOT use empty chamber readings for these values.

3. Cycle a wet grain sample (e.g. 23% to 26% for corn) into the moisture sensor chamber. Write down the known moisture value and the "Rel Vlts" value for the wet sample.

4. Into this spread sheet, enter the readings for the dry grain sample opposite the label "Dry Sample." Enter the readings for the wet grain sample opposite the label "Wet Sample."

5. After entering these values, the table of ordered pairs will be adjusted to match the two given points.

6. In the setup menu of the harvest data software, enter the values of the table below for the grain moisture sensor calibration curve.

Note: Unhiding lines 22 to 25 on the spreadsheet shows the equations that calculate the logarithmic fit characteristic of the EM Grain Sensor output with respect to grain moisture.

	% Moisture	"Rel Vlts"	
Dry Sample:	13.0	1.267	Dry Sample readings
Wet Sample:	25.0	2.550	Wet Sample readings
Generated Curve:			Cal Temp 21.5
	10.0	0.752	
	13.0	1.267	
	16.0	1.674	
	19.0	2.012	
	22.0	2.299	
	25.0	2.550	
	28.0	2.772	
	31.0	2.972	
	34.0	3.153	
	37.0	3.319	
	40.0	3.472	

Table 3-1: Sample EM sensor moisture curve data points

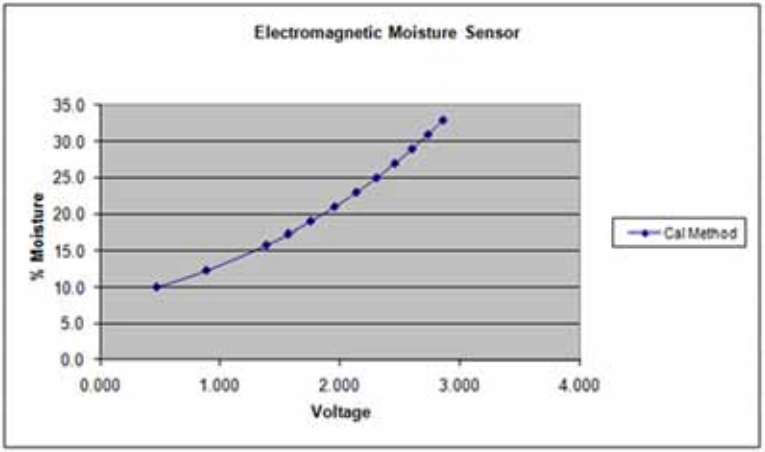


Figure 3-15: EM Sensor moisture curve

Fine Tuning Moisture Curves

If any adjustment is needed to the curve, you can easily adjust the moistures up or down in the curve. First, verify the moistures high or low that the EM sensor is reading and adjust the moistures in the opposite direction in the table of the curve. The example below will clarify this procedure. (Actual moistures and voltage you experience may differ from below.)

In the example below, the EM sensor was reading 1% high, therefore you can adjust the moisture percentages in your curve down by 1%.

Sample 1 = 13.5 %	EM reading=14.5%
Sample 2 = 25%	EM reading= 26%

Adjusted Moisture	Moisture	Volts
0	0	0
9	10	1.22
12	13	1.61
15	16	1.93
18	19	2.19
21	22	2.41
24	25	2.61
26	27	2.77
28	29	2.93
31	32	3.07
34	35	3.19
37	38	3.3

Table 3-2: Moisture Curve Points

Deleting a Curve

The ***Delete*** option in the Moisture Curve menu allows you to remove unwanted moisture curves. To delete an unwanted moisture curve, follow these steps:

1. Select the curve you want to delete and press ***Delete*** (F3).

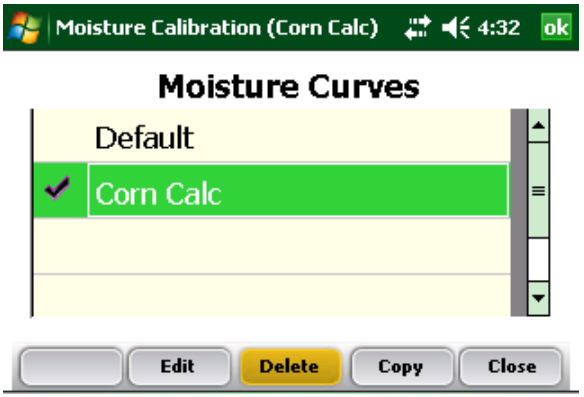


Figure 3-16: Delete a moisture curve by highlighting it and selecting* Delete *(F3)

2. Confirm the delete by selecting ***Yes*** or ***No***.

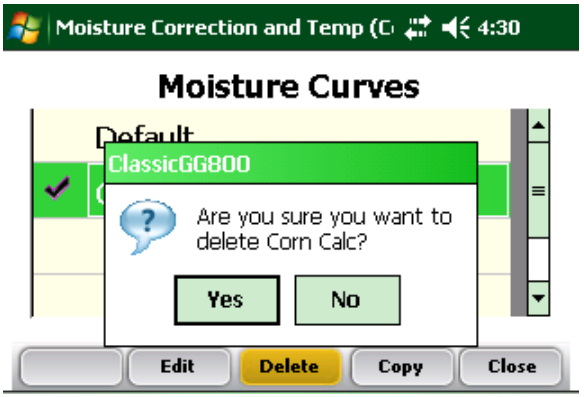


Figure 3-17: Warning screen requires you to choose Yes or No

Copying a Curve

The Default Moisture cannot be modified. To make changes to this curve you must first make a copy of it. Follow these steps to copy a curve:

1. Highlight the moisture curve you want to copy or rename and then press ***Copy*** (F4).
2. Type in the new name of the moisture curve, make any desired changes, then press ***Next*** (F4).
3. Press ***Save*** (F4) to save the file and exit the screen.

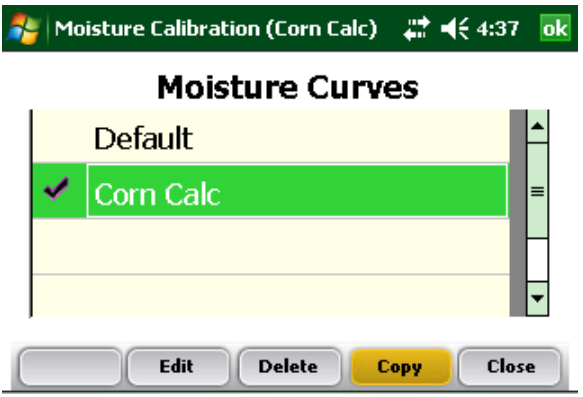


Figure 3-18: Copy a moisture curve by highlighting it and selecting Copy (F4)

Test Weight Chamber Volume

Note: The chamber volumes given below provide a starting point to calibrate your system. They can be adjusted in the program if more accuracy is required. Be certain that your load cell calibration is accurate before changing the chamber volume.

To view or change the test weight chamber volume follow these steps:

1. Choose ***Setup*** (F3) on the main FRS screen, then select Hardware ***Setup > Classic GrainGage Setup > Chamber Volume.***
2. The test weight chamber volume is used in the calculation of test weight of the grain sample. Default values for the chamber volume are as follows

Chamber Size	Cubic Inches	Cubic cm.
3.5 liter	209	3441
1.5 liter	89	1458
3/4 liter	40	655

3. To verify test weight accuracy take a grain sample and verify test weight from a known test weight measurement device. Cycle the grain sample through the GrainGage to get a measured test weight. If the test weight measured by the GrainGage does not match the test weight from a standard, the chamber volume can be adjusted.
4. Take a test sample large enough for at least three full cycles (15-18 lb with a three liter chamber, 8-9 lb. with a 1.5 liter, & 5 lb with a 3/4 liter).

5. Run the sample through a bench standard three to five times and average the readings.
6. Run **the same sample** through the GrainGage in harvest mode three to five times and average the readings.
7. Calculate the new test chamber volume.
8. To adjust the test weight reading from the GrainGage use the following formula

New Chamber Volume =
measure test weight/actual test weight * chamber volume

Example: 56.2 lb./bu / 58.8 * 89 = 85 cu inches.

9. Type the new test weight chamber volume into the text box. For metric conversion the test chamber and test weight should be in cu cm and kg/hl.

Level Sensor

To view or change the settings of the level detect sensor, follow these steps:

1. Choose ***Setup*** (F3) on the main FRS screen, then select ***Hardware Setup*** > ***Classic Graingage Setup*** > ***Level Sensor.***

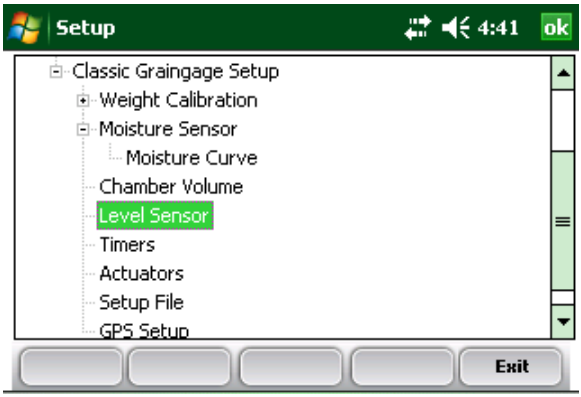


Figure 3-19: Choose Level Sensor from the Setup menu

2. The Level Detect Sensor Settings screen appears (see Figure 3-19).

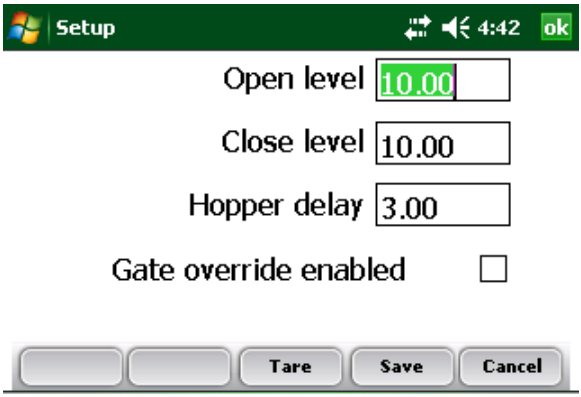


Figure 3-20: Level Detect Sensor Settings main screen

3. The GrainGage uses a level sensor to determine when to

initiate the cycling of the GrainGage. The Open and Close levels are settings that determine the amount of grain in the hopper needed to trigger the GrainGage to cycle. The higher the level setting the more grain required to start the cycle sequence.

Note: Typical values for an HM-800 Classic GrainGage are to set both levels at 10 while values for an HM-400 GrainGage are three.

4. As grain flows into the hopper, it fills around the level detect. When the grain gets high enough to trip the Open level triggers the hopper door opens. The grain has to fill up the middle or test chamber and fill up the hopper to trigger the Close level in order for the hopper door to close.

Hopper Delay

The Hopper Delay setting is a timer used to delay the opening of the hopper door the very first time the Open Level has been triggered. This allows more grain to fill the hopper so that the close level detect will be triggered as soon as the hopper opens. This minimizes excessive packing of grain during this first cycle.

For example: if the hopper delay is set to three, the GrainGage will wait three seconds after the level detect has been triggered before opening the gate.

Timers

The Timer screen is used to adjust various timers used with the system. Each of these timers can be adjusted using the ***Timer Setup*** screen, which is available by choosing ***Setup*** (F3) from

the main FRS screen then selecting ***Hardware System*** > ***Classic Graingage Setup*** > ***Timers.***

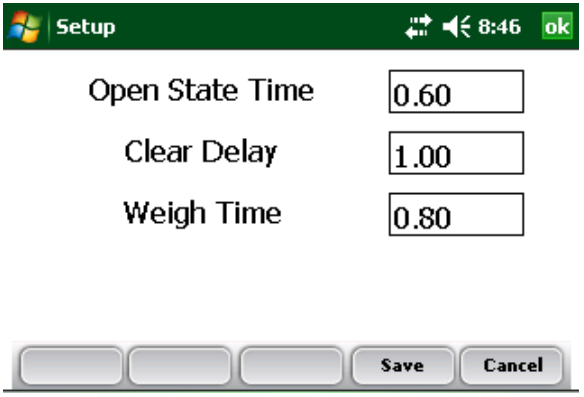


Figure 3-21: Timer Setup screen

- **Open State Time.** Value indicates how long each gate will remain open allowing grain to flow through.
- **Clearing Delay.** When the level of the grain is no longer high enough to trigger the Open Level and Close Level settings, the Clear Delay starts. When the Clear Delay timer expires the system can process a end-of-cycle sequence.
- **Weigh time.** The amount of time data is collected and averaged to determine the actual weight reading

Actuators

The Actuator Setup screen is used to select the appropriate type of actuator and transition times for your system. To access the screen, choose ***Setup*** (F3) on the main FRS screen then select ***Hardware Setup*** > ***Classic Graingage Setup*** > ***Actuators.***

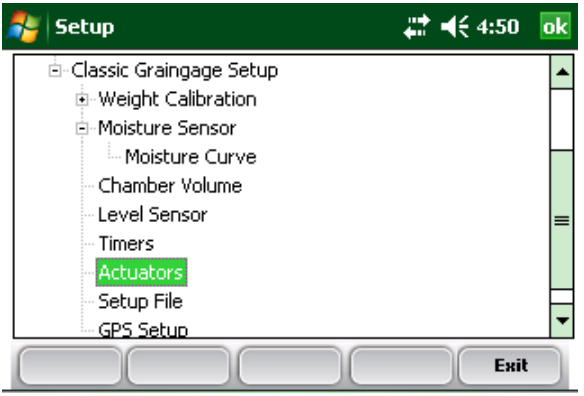


Figure 3-22: Select* Actuators *from the Setup menu to access the Actuator Setup screen

Once you see the Actuator Setup screen, select the appropriate actuator type from the drop-down menu for each actuator.

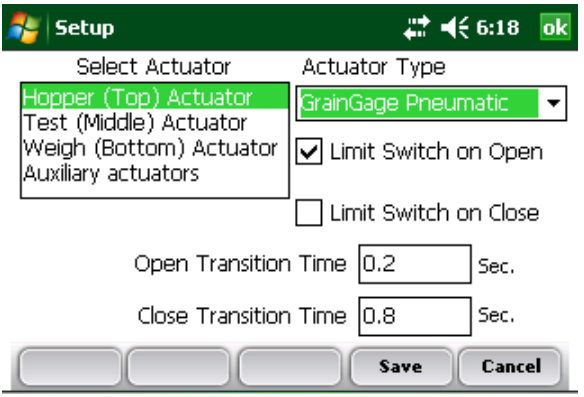


Figure 3-23: Actuator Setup screen

If limit switches are being used (limit switches are used by default and are recommended), check the boxes accordingly. If limit switches are not being used, enter the time in seconds needed for

the stroke of the actuator to fully extend or retract. In the example above, the limit switch is enabled for the Hopper (top) on the opening transition only. On the closing transition, a time of 0.8 seconds controls the actuator.

Setup File

The ***Setup File*** option on the Setup menu is a way to establish specific settings for a specific machine. This is helpful if you want to use your handheld with more than one combine. The steps below explain how to establish setup files for two combines. Once the first combine is set up, repeat the procedure for the second combine.

1. Set up and calibrate one combine.
2. Enter the Setup File screen by selecting ***Setup File*** in the Setup menu. A list of existing setup files appears.

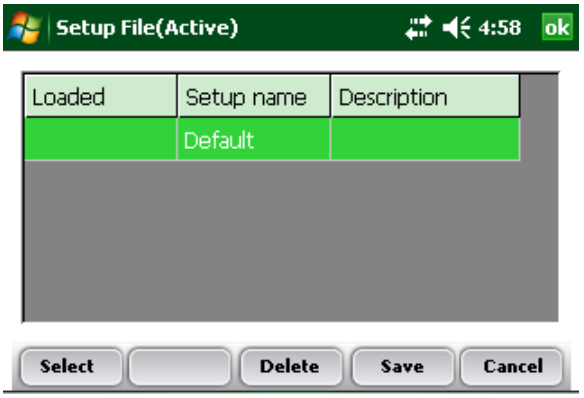


Figure 3-24: Setup files that appear by default

3. By default, the settings you created when you set up and calibrated the handheld were saved to the Default setup file.
4. To create a setup file for a second combine, select ***Save*** (F4).

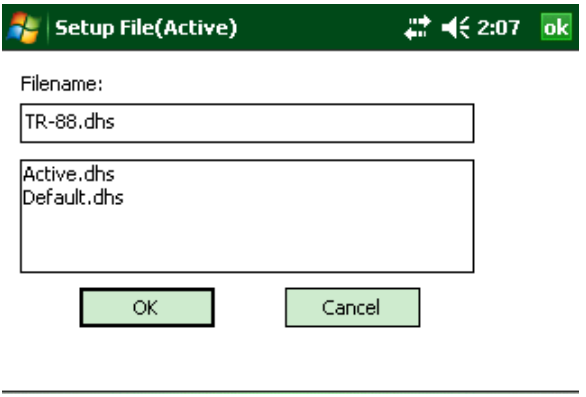


Figure 3-25: Naming a new setup file

5. Create a name for the second setup file.
6. Repeat steps one and two. The new setup file appears.

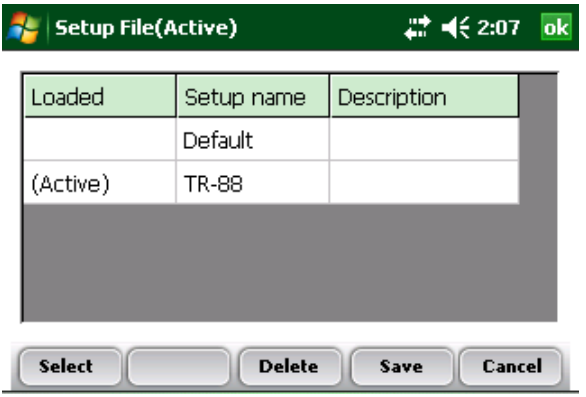


Figure 3-26: The new setup file appears

7. As you can see in the first column, this second setup file is now the active file, which means that any setting and calibrations changes you make are automatically saved to that file. To make another setup file active, highlight it then tap ***Select.***

CHAPTER 4

DIAGNOSTICS MENU

Load Cell

Moisture

Level Detect Sensor

Actuators

Print Calibrations

Diagnostics Menu

The Diagnostics menu is designed to help you troubleshoot and test your hardware. To access this option, select ***Diag.*** (F4) from the main FRS screen. Six submenu options appear on the Diagnostics Menu page, shown in the following image. Each option is described below.

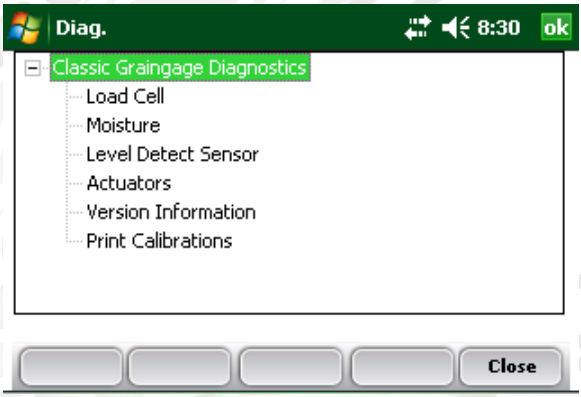


Figure 4-1: Diagnostics Menu screen

Load Cell

Checking the calibration

You can check the calibration of the load cell using the options on the Diagnostics Menu screen. Before you do that, however, first check the accuracy of your calibrations by ensuring that—

- The combine is on level ground and out of the wind
- The weigh bucket is empty
- The calibration weight is close to 5 lb. or 2.23 kg.

Follow these steps to check your load cell calibration:

1. From the Diagnostics Menu, select ***Load Cell.*** The Diagnostics Load Cell screen appears, shown here.

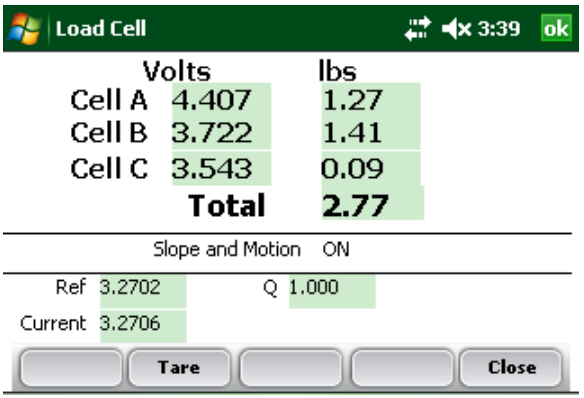


Figure 4-2: Diagnostics Load Cell screen

2. Make sure the weight values for Cell A, Cell B, Cell C and the total weight all equal close to zero. If not, tare the system by selecting ***Tare*** (F2).

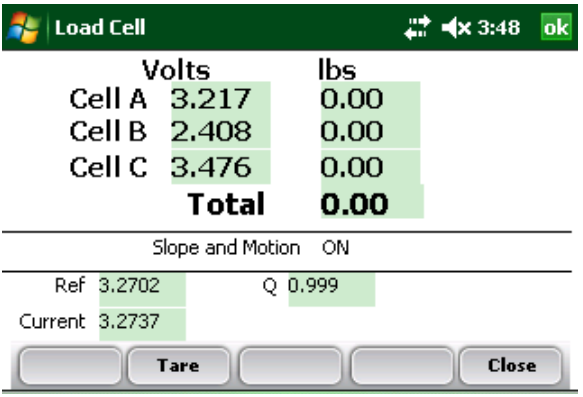


Figure 4-3: Weight values for Cell A, Cell B, Cell C and Total change after a tare

3. Place your known weight onto weigh pan.

4. The weight shown in the Total line should match your known weight. If the weight is incorrect, recalibrate the load cells by returning to the main FRS page and selecting ***Setup*** > ***Hardware Setup*** > ***Classic Graingage Setup*** > ***Weight Calibration.***

In addition to showing information related to the load cells, the Diagnostics Load Cell screen shows the values associated with the Slope and Motion Sensor. Information for this screen is described below.

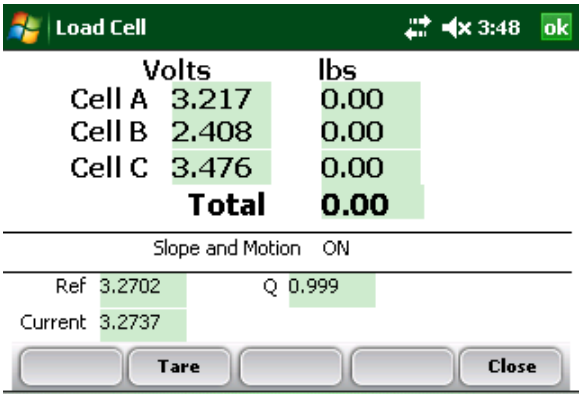


Figure 4-4: Elements of the Diagnostics Load Cell screen

Volts (Voltage)

The Volts reading displays the raw voltage reading from load cells A, B and C.

Lb. or kg (weight)

The Weight reading displays the calibrated weights of the load cells.

Total

This value reflects the total weight on all load cells plus any adjustment if the Slope and Motion sensor was turned on.

Ref, Q, and Total

These values are used for calculations. Note that the Q value should typically read 1.000 with the combine on a flat, level surface. If it does not, we recommend that you disable then re-enable the Slope and Motion sensor from the Setup menu.

SM (Slope and Motion) status

The SM status shows whether the Slope and Motion Sensor is turned ***On*** or ***Off.***

Tare (F2)

Retares the load cells if the Total weight is not zero.

Moisture

The Moisture option allows you to view readings associated with the EM Grain Moisture sensor.

To view the Diagnostics Moisture screen, select ***Moisture*** from the Diagnostics menu. The following information is displayed.

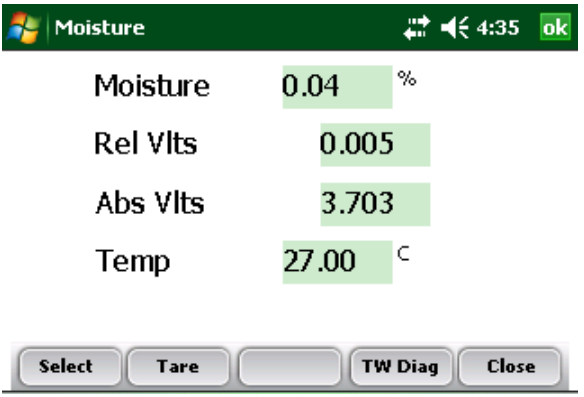


Figure 4-5: Diagnostics Moisture screen

Moisture

The percentage of moisture read by the moisture sensor.

Abs Vlts (Absolute Volts)

The raw voltage reading from the moisture sensor. Primarily used for troubleshooting purposes only.

Rel Vlts (Relative Volts)
The tared-out voltage reading of the moisture sensor. This voltage reading is used in the moisture curves.

Temp (Temperature)
The temperature is read from the moisture sensor in degrees Celsius.

Tare (F2)
To retare the moisture reading, select ***Tare*** (F2).

Select (F1)
Selecting this soft key opens the moisture curve menu screen, allowing you to select a moisture curve to be used for checking calibration. Select the curve and then select ***Select*** (F1) again to return to the previous screen.

LED Codes on the EM Grain Moisture Sensor

Green, yellow, and red LED's (light emitting diode) are designed into the sensor for service and diagnostics purposes. These LED's can be viewed by looking at the right side of the white plastic housing of the sensor. The function of the LED's are described as follows.

Green: On solid when +12 VDC is applied to the sensor

Yellow: Blinks whenever a message is transmitted from the sensor such as when the application software is in the moisture diagnostics menu.

Red: Indicates sensor error conditions. With no error codes, the red alternates one second on, then one second off.

Any error codes are represented by pairs of 'rapid blinking', the number of blinks corresponding to the first and second digit of an error code from the list below:

11. Watchdog reset has occurred

12. Timed Task Buffer overflow detected

13. Low memory alert (M < 50 bytes)

21. Input buffer overrun

22. Checksum error detected

23. Unrecognized command received by sensor

24. RS-485 busy encountered

25. Sensor response message aborted

32. Frequency measurement zero error (no oscillation counts)

33. Frequency measurement range error (over 3 Mhz)

41. Blade voltage range error

42. Temperature sensor zero error (reading at or below –15° C (5° F)

43. Temperature sensor range error (reading above +60° C)

44. System supply voltage below +10.0 Volts

45. System voltage above +18.0 Volts

55. Invalid error code reported

When the sensor is operating normally, no error codes should show. There should just be a steady one second on, one second off blink of the red. Otherwise, general interpretation would be:

11, 12, 13, 55:	Software system problems. Report to customer service and design engineering with description of circumstances.
21, 22, 23, 24, 25:	Faulty sensor wires, or faulty SCCU. These could be caused by some fault within the EMGS, but it is not likely.
32, 33, 41:	Likely cause would be a bad connection from the sensor to the ground plane around the blade, or from the sensor board to the blade.
42, 43:	Assuming the temperature is in a normal ambient range from -10 C to +40 C, these codes would indicate a failed temperature sensor, or board solder connection.
44,45:	These are more likely caused by a problem in the power supplied to the EMGS.

Level Detect Sensor

The Diagnostics Level Detect Sensor screen shows readings from the level detect sensor, which is used to detect the level of grain in a bucket. To access this screen, select ***Diag*** (F4) from the main FRS screen, then select ***Level Detect Sensor.*** The following information is displayed.

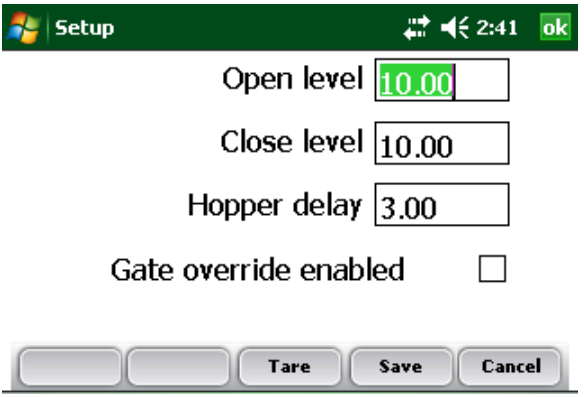


Figure 4-7: Level Detect Sensor screen

Current

The current readings from the level detect sensor.

Tare Value

The zero reference frequency

Trip Point

The minimum reading that the level detect must reach before cycling the system.

Tare (F2)

Retares the level detect reference frequency.

Actuators

This Actuator Controls screen allows you to open, close, or cycle any or all of the actuators. To access this screen, select Diag. (F4) from the main FRS screen, then select ***Actuator.*** The Actuator Controls screen appears.

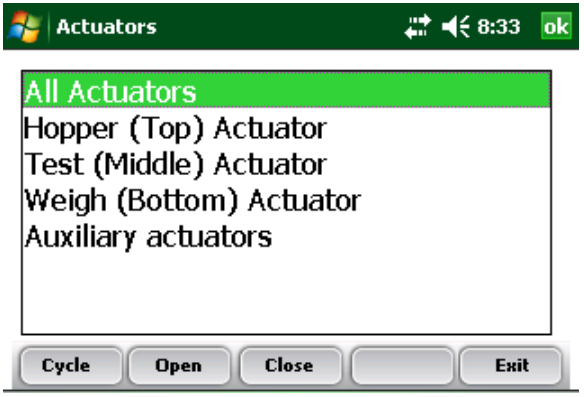


Figure 4-8: Actuator Controls screen

Select the actuator you want to control, and then choose from one of the menu options: ***Cycle*** (F1), ***Open*** (F2), or ***Close*** (F3).

Version Information screen

The purpose of the version information screen is to enable you to see at a glance if you have the latest version of HM-800 firmware in your modules. If you need to update your firmware, or just want to check on the current version, follow these steps:

1. Visit our website at www.harvestmaster.com.
2. Select **Support**.
3. Select **Downloads** under the HarvestMaster menu.
4. Select **Classic Grain Gage.**
5. Choose the version of software for your Allegro (CX or MX) from the appropriate menu.

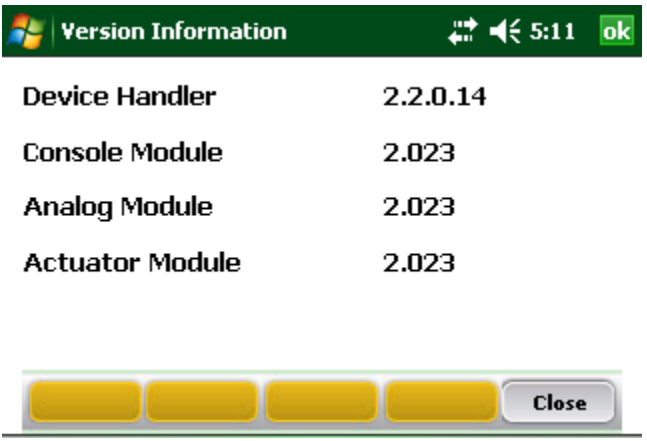


Figure 4-3 Version Information screen

Print Calibrations

The Print Calibrations menu allows you to print your calibration settings. To print, select the **All Settings** option and select **Print** (F1).

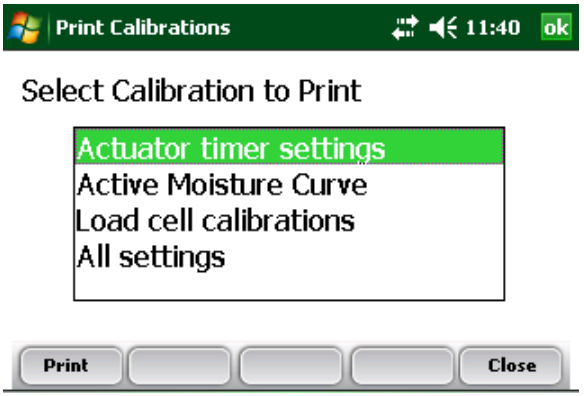


Figure 4-10: Print Calibrations screen

CHAPTER 5

HARVEST DATA COLLECTION

Harvesting and collecting data

Viewing your harvest data using the List Screen

Harvest Data Collection

After you have calibrated the Classic GrainGage, created harvest traits, and created a new harvest trait template, you are now ready to collect data. This chapter explains how to prepare for, collect, and view harvest data using FRS. For addition information, refer to the ***FRS Field Reference Guide (Note Taking)*.**

Preparing to collect harvest data

Follow these steps to prepare FRS to collect harvest data:

1. On the FRS Main Screen, make sure the Active Devices box shows Classic in the Setup menu under **System > Manage Devices.**

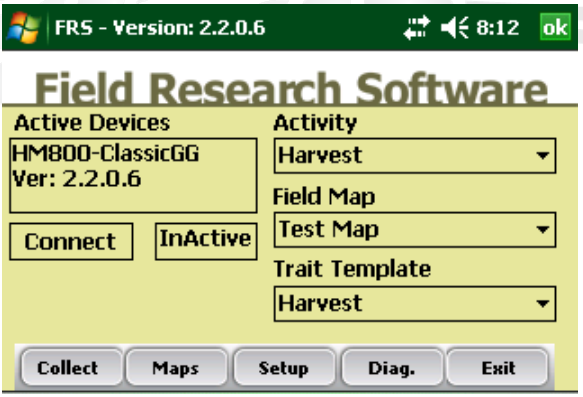


Figure 5-1: The HM-800 Classic appears in the Active Devices box

2. Select the appropriate activity from the Activity drop-down menu on the FRS Main Screen. For example, if you plan to use FRS for harvesting, select the ***Harvest*** Activity. For standard plot lengths, set the activity to Harvest-Plot.

3. On this same screen, select the correct field map name from the pull down menu.

Note: If you need a new field map for harvest, create one before proceeding to the next step. Refer to the FRS Note Taking Field Reference Guide (Note Taking) manual for instructions on creating a new field map.

4. Select the trait template you want to use from the Trait Template drop-down box. Options include the harvest traits you created such as Weight, Moisture or Test Weight.

5. Select ***Collect*** (F1) to enter data collection mode. The Moisture Calibration screen appears.

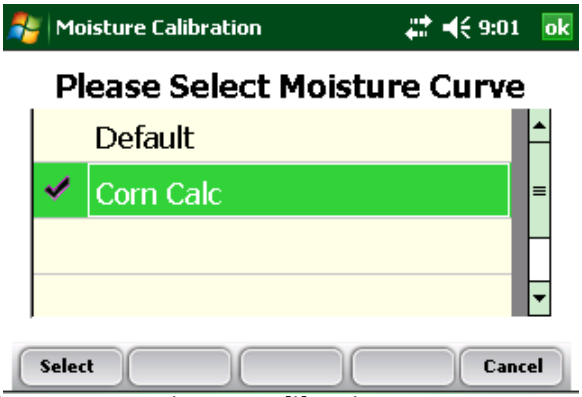


Figure 5-2: Moisture Calibration screen

6. Select a moisture curve from the list, then tap ***Select*** (F1). Wait while harvest set ups are loaded.

7. The Collect Data Spatial screen appears, shown below.

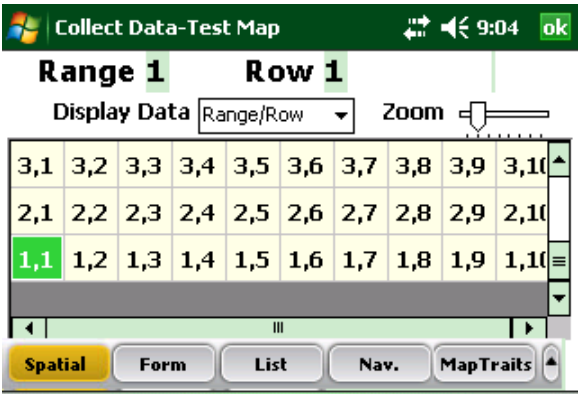


Figure 5-3: Row 1, Range 5 is selected in the Collect Data Spatial screen

8. Choose the starting plot location by selecting the cell. In Figure 5-3, the selected cell is Row 1, Range 1. After you select on the starting plot cell, the screen shows the combine's current location in the field and which plots have already been harvested.

9. Establish your navigation type by selecting ***Nav.*** (F4). The ***Select Navigation*** screen appears.

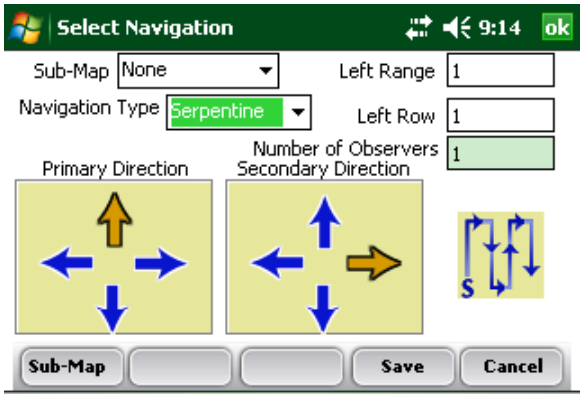


Figure 5-4: Select Navigation screen for a single plot combine

Navigation Type

The navigation type is the harvest route through a field. Select a navigation type from the pull down menu. Examples of Navigation patterns for harvest are shown below.

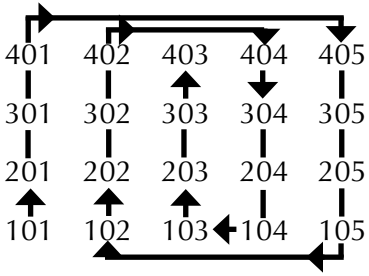


Figure 5-5: Circular navigation type

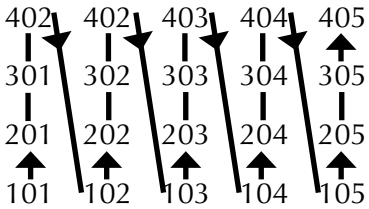


Figure 5-6: Sequential navigation type

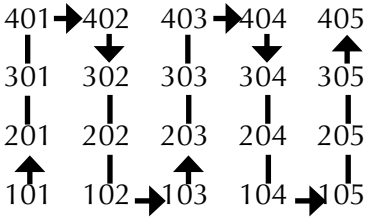


Figure 5-7: Serpentine navigation type

Select ***Save*** (F4) to save your settings.

Harvest Sequence

The Classic GrainGage is an all-inclusive system with a hopper chamber, test chamber and plot chamber. These chambers are stacked on top of one another inside of the GrainGage. A slide gate or door separates the chambers. Unlike bucket systems that measure all of the grain in a plot at once, the GG processes the grain in batches or incrementally.

Plot Harvest

1. Press the blue key followed by the F6 key to begin the Tare sequence.
2. The user drives the combine through the 20 ft. plot. Grain is shelled in the combine and routed into the holding hopper. At the end of the plot, the user stops the combine allowing it to clean out. The Classic GrainGage begins processing the grain as it reaches the holding hopper.
3. When grain level inside of the hopper reaches a point high enough to trigger the Open Level, the Classic GrainGage begins to cycle.

4. The Hopper door opens. Grain drops into the Test chamber filling it up until it reaches a point on the level detect to trigger the Close Level which causes the hopper door to close.
5. With the Hopper door closed, the Moisture readings are taken by the EM Sensor. The Test Chamber should be full in order to get accurate Moisture and Test Weight readings.
6. After Moisture has been recorded, the test chamber door opens dropping the grain into the Plot chamber. The test chamber closes initiating the weigh cycle.
7. The grain weight is measured in the Weigh or Plot chamber. After this reading has been taken, the Plot door opens dumping the grain out of the GrainGage.
8. At this point, the weight and average moisture are displayed on the screen of the handheld along with cycle count.
9. This process continues as long as grain is high enough in the Hopper Chamber to trigger the Level Detect. The system does not have to wait for the Plot finish before the Hopper door opens to dump the next amount of grain in the Test Chamber. As soon as the Test chamber door has closed indicating its contents have been emptied, the Hopper door can open.

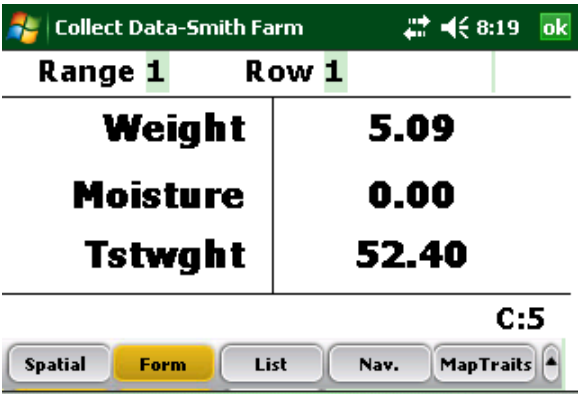


Figure 5-8: Classic GrainGage cycling

10. If the grain fails to trigger the Level Detect, the system stops cycling on its own. The user will then press the Enter key to initiate two complete cycles of the system to clean out the remaining grain. No moisture or test weight is recorded during these last two cycles, only plot weight.

Note: If the user presses the Enter key at any time while the GrainGage is processing grain, the Enter key is registered but the GrainGage continues to cycle. The Enter key is processed as soon as the grain level no longer triggers the level detect.

After the second clean out cycle, the total Weight, Average Moisture, and Average Test Weight for the entire plot are stored into the FRS database and sent to the printer. Backup data is also stored in log files and data are displayed on the screen. The last chamber weight is also shown at the bottom of the screen.

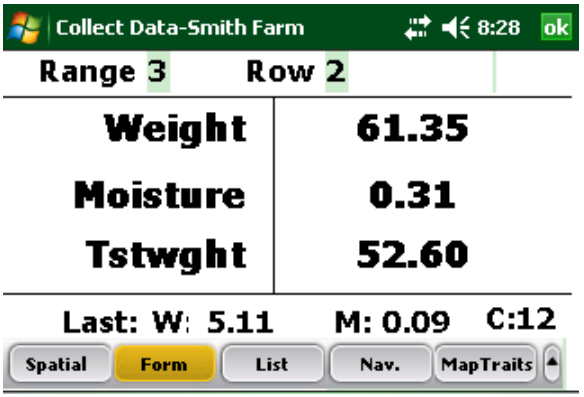


Figure 5-9: Total plot info

11. The user can drive into the next plot as soon as the Enter key is pressed or after data is sent to the printer whichever is preferred by the driver.

Viewing your harvest data using the List Screen

By selecting ***List*** (F3), you can view your harvest data.

Note: You CANNOT collect harvest data while you are in this screen. To harvest, you must be in the Form screen. See the section above called ***Plot Harvest Sequence*** for details.

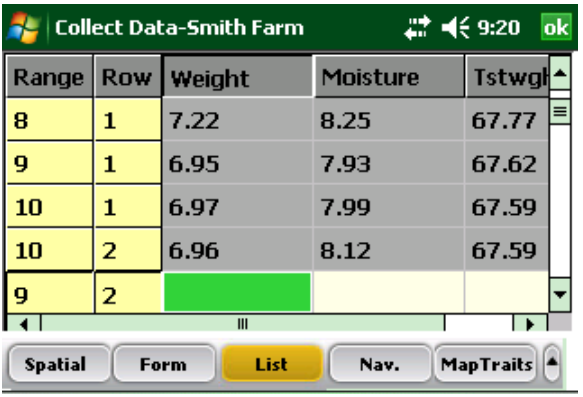


Figure 5-10: List screen showing moisture, test weight, and weight values for each plot

CHAPTER 6

EXPORTING DATA

Extracting collected data

Backup Log for Harvest Modules

Exporting Data

Extracting collected data

The first step in exporting data is to extract collected data from the FRS database to the Export folder on the handheld. To extract data, follow these steps:

1. Select ***Setup*** on the main FRS screen to enter the Setup screen.

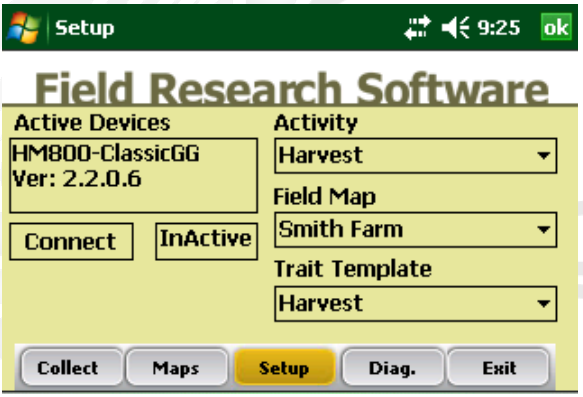


Figure 7-1: Select **Setup** *from the main FRS screen*

2. Choose ***Database Tools*** > ***Export data*** to CSV from the Setup menu.

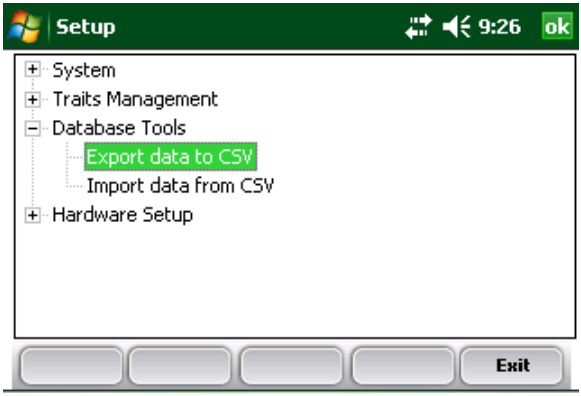


Figure 7-2: Choose* Export data to CSV *from the Setup menu

3. The Import/Export Utility screen appears. Select ***Export from FRS Database.***

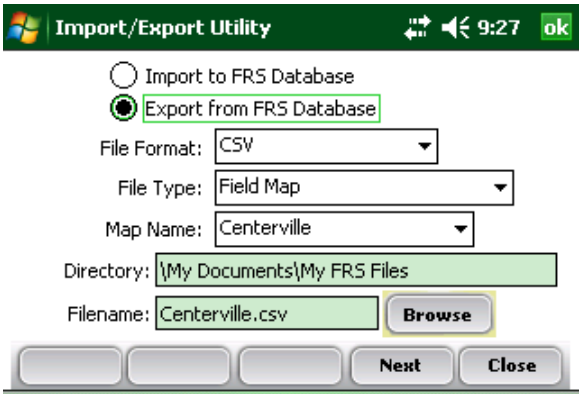


Figure 7-3: Import/Export Utility screen

4. Fill in the information on the Import/Export Utility screen. For more information about the elements on the screen, see the ***FRS Note Taking Field Reference Guide.*** To find the map file you want to export, choose ***Browse.***
5. Select ***Next*** (F4).

If you extracted a field map, the Export Map Data screen appears, showing the target path where the file will be saved. Select the option to ***Include previously exported data*** if you plan to export all data associated with this map. If you only want to export new data associated with the map in the future, leave the option unselected.

After data has been exported to the handheld, it can be copied to the desktop using ActiveSync.

Refer to the ***FRS Note Taking Field Reference Guide*** for more details on exporting data.

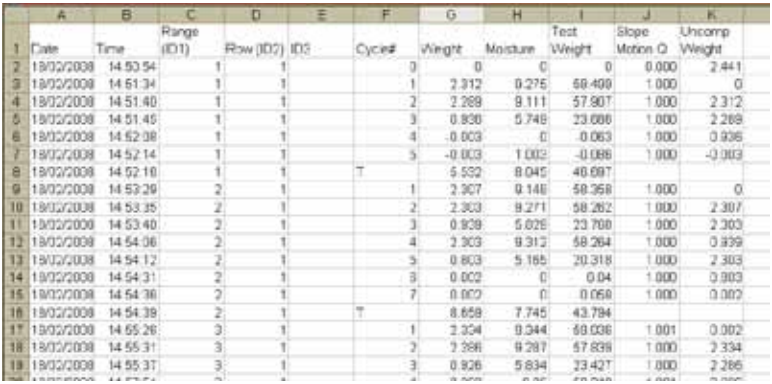
Backup Log for Harvest Modules

FRS software creates a backup log of data that has been collected from the harvester. This log file contains the date, time, range, row, plot weight, moisture, and test weight for each plot harvested. It also contains values used for moisture and test weight calibration, and Slope and Motion compensation, or Q value. The backup log file is found on the Allegro, see Figure 7-4.

Path: C_Drive\FRS\HarvestBackup.

Each backup log references the same name as the field map

used for harvest. For example, if the name of the field being harvested is Smith Farm, the name of the backup log would be Smith Farm_Classic.csv.



	A	B	C	D	E	F	G	H	I	J	K
1	Date	Time	Range (ID1)	Row (ID2)	ID3	Cycle#	Weight	Moisture	Test Weight	Slope Motion Q	Uncomp Weight
2	18/02/2008	14:50:54	1	1		0	0	0	0	0.000	2.441
3	18/02/2008	14:51:34	1	1		1	2.312	9.275	59.409	1.000	0
4	18/02/2008	14:51:40	1	1		2	2.269	9.111	57.907	1.000	2.312
5	18/02/2008	14:51:45	1	1		3	0.936	5.748	23.686	1.000	2.269
6	18/02/2008	14:52:08	1	1		4	-0.003	0	0.063	1.000	0.936
7	18/02/2008	14:52:14	1	1		5	-0.003	1.003	-0.086	1.000	-0.003
8	18/02/2008	14:52:19	1	1		T	5.532	8.045	46.697		
9	18/02/2008	14:53:29	2	1		1	2.307	9.148	59.358	1.000	0
10	18/02/2008	14:53:35	2	1		2	2.303	9.271	58.262	1.000	2.307
11	18/02/2008	14:53:40	2	1		3	0.939	5.026	23.708	1.000	2.303
12	18/02/2008	14:54:06	2	1		4	2.303	9.312	58.264	1.000	0.939
13	18/02/2008	14:54:12	2	1		5	0.803	5.165	20.318	1.000	2.303
14	18/02/2008	14:54:31	2	1		6	0.002	0	0.04	1.000	0.803
15	18/02/2008	14:54:36	2	1		7	0.002	0	0.058	1.000	0.002
16	18/02/2008	14:54:39	2	1		T	8.658	7.745	43.784		
17	18/02/2008	14:55:26	3	1		1	2.304	9.344	59.036	1.001	0.002
18	18/02/2008	14:55:31	3	1		2	2.286	9.287	57.839	1.000	2.304
19	18/02/2008	14:55:37	3	1		3	0.926	5.834	23.427	1.000	2.286

Figure 7-4: Example of backup log file.

CHAPTER 7
GENERAL CARE AND MAINTENANCE

Classic GrainGage Regular Maintenance

Return for Repair Procedure

General Care and Maintenance

Classic GrainGage Regular Maintenance

HarvestMaster products are built to be robust and will withstand most weather conditions. All of our products are environmentally sealed and built for outdoor use. However, there are some steps you can take that will increase the operational life of the system. The following tips will help you to have fewer problems and will ensure the maximum life out of your system.

Recommended Pre-Harvest Maintenance

We recommend starting your pre-harvest checklist at least two weeks before you plan to be in the field. In addition, we also recommend that when you are checking calibrations that you run several samples of grain with known weights and moistures through the system to assure accurate moisture and weight calibrations.

All Systems

- Clean the combine battery terminals to assure a good power and good connection.
- Inspect all cables for mice damage.
- Make sure all cables are secure (“click” lock into place) and are not touching or interfering with the weigh bucket assembly.

- If equipped with a pneumatic air system, check the filters and lubricator for contamination. Replace as necessary. Close the petcock valve on the air tank and charge the system up to 120 PSI. Check for air leaks. Operating pressure should be regulated to 50 PSI.
- Check the limit switches for proper function (adjust if needed).
- Check the actuator operation for each door assembly for normal operation. Slow moving actuators are usually an indication of a plugged metal porous vent on exhaust port of solenoid. Replace or clean as needed.
- Ensure the weigh bucket or pan moves freely. Verify air hoses and cables are not interfering with the weigh pan.
- Check the actuators and slides for proper function and adjustment. If needed, lubricate the slides with DRY graphite to minimize gum or chaff buildup. ***CAUTION:*** Do not use wet lubricants on the gate assemblies.
- Run "DIAGNOSTIC" menu checks on the load cells, moisture sensor, and level detect sensor as outlined in the Diagnostics section of this reference guide.
- Check weight and moisture calibrations.

Recommended Maintenance during Harvest (each morning)

- If your GrainGage is equipped with pneumatics, drain the water from the air tank using the petcock relief valve.

- Drain water from the lubricator/water separator bowl by pulling down on the drain plug.
- Blow chaff and broken kernels out of and from around the weight bucket or pan.
- Check the load cell calibration using a known weight.
- Check the compressor air filters.

Recommended Post-Harvest Maintenance

- Print setups and moisture curves. Save and file this information in an area where it can be found in future years if needed.
- With about 120 PSI forced air, blow all chaff and broken kernels out of and from around the weigh bucket or pan. With the Classic GrainGage, be sure to get around the back load cell. Blow upward (from the bottom of the GrainGage) on each overload protection pin to ensure all the debris is out of the channels and away from the protection pins.
- Avoid using water to clean in and around the weigh systems. If you use a sprayer washer to clean the combine, be sure to keep the water away from all sensors and cabling.
- Disconnect the air hose from the GrainGage and let the air run (free-flow) for at least five minutes.
- Drain the air tank.
- Drain the pneumatic filter bowls and blow them dry with forced air.
- If the system has pneumatic actuators (e.g. GrainGages), retract all the cylinder rams into the housing.

- If mice have been a problem in the past, place mouse poison or traps in areas where mice might appear. Moth balls tend to help as well.
- If your Harvest Data System console is mounted outside of the cab (e.g. exposed to the elements), we recommend removing or covering the control box. It is best to store your system in a warm and dry environment.
- If the combine is not protected from the weather, cover any exposed cable ends (connectors) with plastic bags and secure tightly with twist-ties or rubber bands.

Installation and Maintenance Tips

We suggest the following tips when installing and/or maintaining the Harvest Data System:

When using pneumatics:

Note: We recommend that oil not be used in the pneumatic system of the Grain Gage. Please refer to older manuals at HarvestMater.com if your system is currently using oil.

- Install a three- to five-gallon reservoir air-tank. This tank must have a petcock type drain valve or an electronically controlled drain valve to allow any water that accumulates inside the tank to be drained.
- Install the Bosch Combo filter/regulator as close to the Classic GrainGage as possible
- If areas of high humidity or when using a lubricated compressor it is recommended to install a Kaeser Model KOR-20.

- Replace the Kaeser filter every 100,000 plots or when the indicator is mostly RED. Us the “USOR-20” replacement filter element (sourced by Juniper systems).

CAUTION: Certain compressor oils, chemicals, household cleaners, solvents, paints, and fumes may damage the plastic bowl. Be sure that you use cleaning chemicals that are safe for polycarbonate material.

Operating Specifications

The following operation specifications show the maximum pressure and temperature ratings for the filter bowl:

Bowl Type	*PSIG*	*Temperature*
Transparent Plastic	150 (10.3 bar)	125° F (52° C)
Metal	200 (14 bar)	175° F (79° C)

Air Regulator

The regulator should be adjusted between 50 and 85 PSI. Colder temperatures may require higher pressures.

To adjust the pressure, complete the following steps:

1. Unlock the regulator by pulling down on the adjusting valve.
2. Turn the regulator clockwise to increase the pressure and counter clockwise to decrease the pressure.

Replacing the Kaeser Filter USOR-20

1. Release the air pressure from the air lines by either opening the relief valve on the GrainGage or opening the drain valve

on the air tank.

2. Turn the filter bowl housing ¼ turn counter clock-wise and gently pull down on the bowl while gradually tipping the bowl back and forth until it is removed.
3. Remove the RED filter by turning it counter clock-wise (as if removing a right handed screw).
4. Install new filter and tighten finger tight.
5. Reinstall filter bowls housing in reverse order as removed.

Cylinder Removal and Installation

The cylinders on the Classic GrainGage can become worn from constant use and eventually wear out. As the cylinder wears out it leaks air, or responds slowly to the open and close command front console. When this starts happening, its time to remove your old cylinders and install new ones.

Load Cell Replacement Procedures

CAUTION: The load cells in this system are extremely delicate. DO NOT allow your arms or tools to press upon the weigh pan or individual load cells at any time.

Tools Needed

We recommend you have the following tools on hand to aid in replacement of the load cells:

- Allen wrenches (5/32″ and 3/16″)
- Socket set (3/8″ drive with 7/16″ socket and short extension)
- 7/16″ end wrench (preferably 2″ long)
- 0.020 feeler gage or load cell adjusting shim.
- Loc-Tite 242 Thread Locker
- Flat head screwdriver (4.0 x 60 mm)

Procedures

Preparation

1. Disconnect the air supply to the GrainGage by turning the air control valve to the off position.
2. Position the Field Computer so that you can see the display while working on the GrainGage.
3. Position the shipping stops (PVC block) under the weigh pan so the weight is OFF the load cells.
4. Enter the Harvest Data program and at the Main Menu select

"Diagnostics" and then "Load Cells." Your display will show four voltages for the 800 system. The 800 will be labeled A, B, C, and Total:

Cell A	This is the total of the front left load cell.
Cell B	This is the total of the rear left load cell.
Cell C	This is the total of the right load cell
Total	This is the total of all three load cells.

5. Take note of the "Cell A," "Cell B," "Cell C," and "Total" voltages. This is the zero offset for each load cell.

Note: During the following procedures watch the total voltage column to make sure that it does not exceed a specification of + or – 1.5mV. Ideally, this reading should stay as close to 0.00 mV as possible.

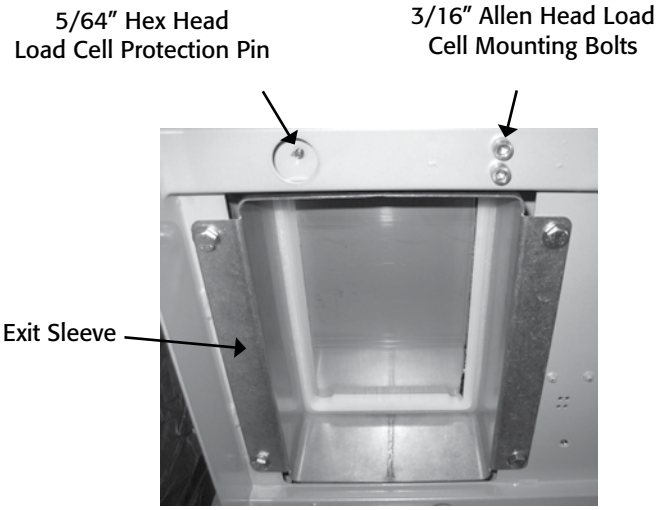


Figure 7-2: GrainGage exit sleeve (bottom view)

Weigh Chamber and Weigh Pan Removal

Do not place excessive upward or downward pressure on the load cells during this procedure.

1. Using the 7/16″ end wrench or 7/16″ socket and extension, remove the four 1/4″ exit sleeve bolts from the bottom of the GrainGage and remove the exit sleeve (refer to Figure 7-2 GrainGage Exit Sleeve).
2. Slide the bottom gate halfway open so the gate connecting pin on the actuator aligns with the hole in the weigh pan (refer to Figure #2 GrainGage Weigh Pan Assembly).
3. Remove the E-rings from the bottom gate connecting pin and push the pin out. Close the bottom gate.

Note: The E-ring can be removed by using a screwdriver to pry the edge of the E-ring away from the pin until it snaps free.

4. Disconnect the air hoses from the actuator cylinder by pressing the orange into the hose and pulling the hose out (take note of their proper positions).
5. Using the 7/16″ socket and ratchet (without extension), remove the two 1/4″ bolts on the gate guide closest to you (front gate guide) and then remove the three 1/4″ mounting bolts from the bottom weigh chamber (two in front and one in back). Set the gate guide aside for future reference (Refer to Figure 7-3).
6. Using a 5/32″ Allen wrench, remove the guide pin located

at the left front corner of the weigh pan, being careful not to exert any pressure on the load cell.

7. Using the 5/32″ Allen wrench, remove the guide pin located on the right side of the weigh pan (in front of the actuator).

8. Make sure the shipping stops are disabled by following the procedures outlined below:

   a. Remove the three shipping stop Hex bolts.

   b. Remove the three PVC spacers between the weigh pan assembly and the bottom of the GrainGage.

Note: Keep these parts in a convenient place in case you need to ship the GrainGage by mail. The shipping stops are not needed when the GrainGage is mounted to the combine.

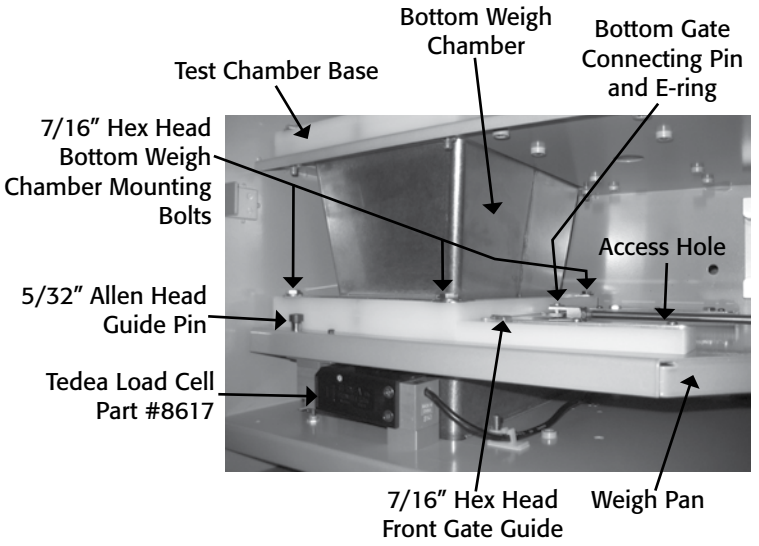


Figure 7-3: GrainGage weigh pan assembly

9. Lift the lower chamber up firmly against the top of the test

chamber base and carefully slide the white weigh chamber base out of the GrainGage. The lower stainless steel chamber has a 1/8″ lip on the bottom skirt. When removing, make sure to lift the white base over the protruding rubber nipple on the weigh pan.

CAUTION: Be careful not to exert too much downward pressure on the load cell when removing the weigh chamber base.

Note: If removing the base is too difficult, the top and middle 1/4″ chamber mounting bolts (three places on each level) can be loosened to allow more movement.

10. Remove the bottom weigh chamber. Set the chamber and the base aside for future reference.
11. Disconnect the actuator limit switch cable. The connector for this cable is located on the actuator module on the middle level.
12. Carefully lift the weigh pan up and out of the GrainGage.

Load Cell Removal and Installation

1. Use the 3/16″ Allen wrench to remove the load cell mounting bolts. Then remove the load cell.
2. Remove the two 3/16″ Allen screws from the aluminum spacer attached to the load cell and re-install the spacer on the new load cell.

Note: Make sure the spacer is aligned with the edge of the load cell before tightening the bolts.

Note: Before re-assembling, clean all the screws with a fine wire brush. Use #242 Loc-Tite on all screws during reassembly (refer to Figure 7-4).

3. Remove the load cell stop (hex bolt) from the end of the load cell.

4. Install the load cell stop in the end of the new load cell until there is a 1/16″ gap between the load cell and the hex head. Use #242 Loc-Tite when reassembling.

5. Disconnect the old load cell cable and secure the new load cell cable in its place (use plastic ties to hold the cable away from the weigh pan).

WARNING: Make sure the load cell stop is not touching the overload protection pin when tightening the load cell mounting bolts as this may cause the load cell to stretch or overload.

6. Place Loc-Tite on the two load cell mounting bolts and install the new load cell on top of the load cell mounting spacer. Make sure the load cell protection pin is centered under the load cell stop bolt.

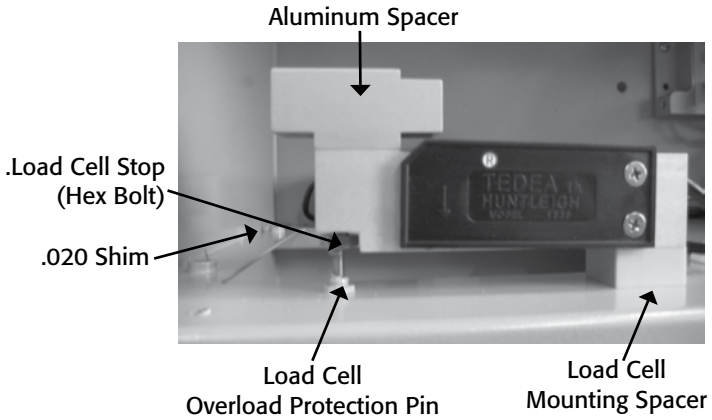


Figure 7-4: Load Cell

7. Adjust the overload protection pin down (or load cell stop up if the pin will not adjust) until you can just slide the 0.020 shim between the overload protection pin and load cell stop. The shim should slide out with between 0.010 and 0.020 voltage change on the display of the Field Computer in the "Diagnostics" menu.

Note: Make sure the protection pin and load cell stop are securely in place with #242 Loc-Tite.

8. After the load cell is completely installed, use the following procedures to check that the load cell is functioning properly:

   a. Select "Load Cells" from the "Diagnostic" menu and make sure the voltage for the load cell you are testing is between 0.00 mV and +.150 mV (this is the zero offset).

   b. Make sure all three load cells are plugged in and lock collars are secure.

   c. Retare the weights.

Note: If the limit switches are enabled, you will need to press the ESC key three times to bypass the "Gate Obstruction" message.

   d. Write down the reading of the total weight of all three load cells (should be 0.00 lb.).

9. Install the weigh pan assemblies in reverse order of disassembly. Remember to place Loc-Tite on all mounting bolts.

Note: When installing the weigh pan, you do not need to reinstall the shipping stops.

GrainGage Chamber Installation

Preparation

Following are the instructions for removing the chambers on the GrainGage and installing new chambers. During this process you will either be installing 3 liter chambers in place of 1.5 liter chambers or 1.5 liter chambers in place of 3 liter chambers. When removing your existing chambers make sure that you keep track of all the screws you remove because you will use these same screws when you install the new chambers. Typically this process takes about forty minutes.

Tools Needed

- Medium Phillips screwdriver
- Medium flat head screwdriver
- 7/16″ shallow socket (recommended) or 7/16″ combination wrench

Procedure

Removing the Existing Chambers

Use the following steps to remove the existing chambers:

1. Remove the GrainGage door.
2. Using a Phillips screwdriver, remove the two screws holding the level detect sensor to the hopper on the top shelf. Rotate the sensor out of the way toward the back right corner.
3. Remove the side screws from the moisture sensor on the middle level using a Phillips screwdriver. Slide the moisture sensor out and place it out of the way.

4. Starting with the top level gate, slide the pneumatic actuator rod to the right until the pin connecting the actuator rod and the gate is directly over the access hole on the bottom of the shelf. Using the standard screwdriver, remove the E-ring from the actuator pin assembly. Remove the pin from the actuator and slide the actuator rod back toward the actuator. (If you remove the slides from the plastic housing, recognize that the top shelf slide is 2" shorter than the middle shelf slide.)
5. Repeat step 4 with the middle level gate.
6. Remove the 1/4" cap screws from the slide guides on both levels and remove the guide.
7. Remove the three 1/4" cap screws from the plastic slide housing on both levels.
8. On the 1.5 liter chambers, remove the two screws holding the chamber to the slide housing.
9. Lift the middle chamber up toward the top of the GrainGage and remove the middle level plastic slide housing from the shelf. Pull the chamber down and remove from the GrainGage.

CAUTION: Be careful not to put weight on the bottom chamber or the weigh pan. This may damage the load cells.

10. To remove the top chamber, repeat step 8 above (substituting "top" for "middle").

Installing the New Chambers

Use the following steps to install the new chambers:

1. Slide the top level chamber into place making sure it fits

into the groove in the gasket. It may be useful to attach thin double-stick tape to the "fingers" on the base of the 1.5 liter chamber to help hold the gasket in place.

2. Lift the top chamber up toward the top of the GrainGage and push the plastic slide housing into place beneath the chamber.

3. Repeat steps 1 and 2 to insert the middle chamber.

CAUTION: Be careful not to put weight on the bottom chamber or the weigh pan. This may damage the load cells.

4. Insert the three 1/4" cap screws into the holes on the plastic slide housing on each level and tighten them.

5. Place the plastic slide guides in place (use the inner holes for 1.5 liter chamber and the outer holes for 3 liter chamber). Insert the 1/4" cap screws into the holes and tighten them. Do this for both levels.

6. Starting with the middle level gate, slide the pneumatic actuator rod to the left until the hole for the pin is directly above the access hole. Slide gate to meet actuator rod end and replace pin. Snap E-ring back into place. Repeat this step for the top level gate.

7. Slide the moisture sensor into place. Insert the screws into the side holes on the moisture sensor and tighten them. (The screws for the moisture sensor are longer than the screws for the level detect sensor.)

8. Rotate the level detect sensor into place. Insert the screws and tighten them.

9. Replace the GrainGage door.

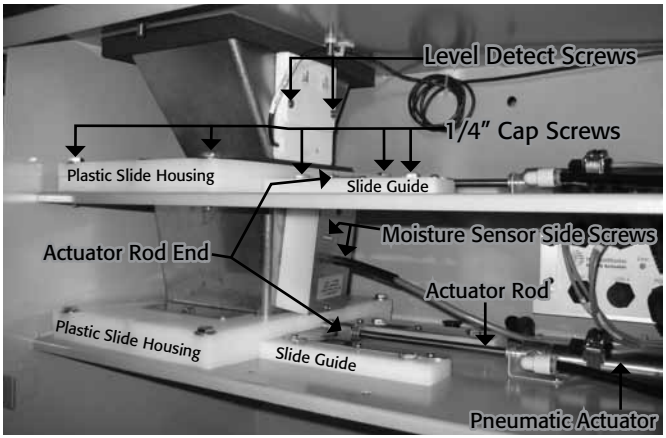


Figure 7-5: GrainGage chamber

If you have any maintenance questions, please contact a Juniper Systems Technical Service Representative at (435) 753-1881 or email them at techsupport@junipersys.com.

Return for Repair Procedure

In the event that your Harvest Data System needs repairs, contact a Juniper Systems Technical Service Representative for a Returned Materials Authorization (RMA) number. Please have the following information ready when you call:

- Serial Number
- Model Number
- Name and Company/University/Agency
- Phone and Fax Numbers
- Clear description of problem

- Purchase Order Number and Billing Address

Under the Premium Support Agreement, HarvestMaster will ship you a replacement loaner Next Day Federal Express or UPS Red. To avoid any problems in the return procedure, complete the following steps:

1. Once you receive the loaner unit, fill out the shipping and RMA forms that were included with your loaner equipment. Include a description of the failure. The more information you can supply concerning the malfunction and the circumstances under which it occurred, the quicker our technicians can complete the repair.
2. Package your equipment in the same box (if the existing box is still good). Package the unit properly to avoid shipping damage.
3. Write the RMA# on the package you ship. Ship it Federal Express, Next Day Air Mail, or UPS Red.

Your equipment will be repaired and returned to you. After receiving your repaired equipment, you will be authorized a period in which to return the loaner unit before you will be billed for it. There is an annual service and support fee that allows you to have this service. Please call for detailed information and pricing.

APPENDIX

Appendix A—Warranty

Appendix B—Mounting Diagrams

Appendix C—Cable Wiring Diagrams for the HM-800

Appendix A
Warranty

Limited Warranty

Hardware

All products manufactured by Juniper Systems, Inc. (Juniper Systems) when properly installed, calibrated, and operated in accordance with instruction manuals accompanying the hardware and used for the purpose for which the hardware was designed shall be free from defects in materials and workmanship for a period of one (1) year from the date of shipment.

In the event a defect in materials or workmanship is discovered and reported to Juniper Systems within the one-year period, Juniper Systems will, at its option, repair the defect or replace the defective product. Juniper Systems' obligation hereunder will be limited to such repair or replacement.

The customer shall have the responsibility to ship the defective equipment to Juniper Systems with all cost of shipment prepaid. After repair or replacement Juniper Systems will, at their own expense, ship the replacement or repaired item back to the customer using the same type of carrier.

Software

Software products that are designed by Juniper Systems for use with a hardware product and that are properly installed on that hardware product are warranted to the end user not to fail to execute their programming instructions due to defects in materials or workmanship for a period of one year from date of delivery.

If Juniper Systems receives notice of such defects during the one year warranty period, Juniper Systems shall, at its option, repair or replace the defective software media. Warranty is limited to repair or replacement of software media.

The warranties provided herein do not apply in the case of improper or inadequate maintenance or in the case of repair by any person not previously authorized in writing by Juniper Systems to do such maintenance or make such repairs.

These warranties likewise do not apply where the products have been operated outside the environmental specification of the product, where software products other than those specified by Juniper Systems have been used, or where attempts at software interface have been made by any person not previously authorized by HarvestMaster to perform such interfacing operations.

Disclaimer of Warranties

The warranties set forth herein are in lieu of all other warranties of Juniper Systems, whether written, oral or implied. Juniper Systems makes no warranties regarding its products (hardware or software), including without limitation warranties as to merchantability, fitness for a particular purpose, any warranty arising from course of performance, course of dealing, or usage of trade whether any of the foregoing warranties are either expressed or implied.

Juniper Systems specifically makes no warranties as to the suitability of its products for any particular application. Juniper Systems shall in no event be liable for special, incidental, or consequential damages in connection with or arising out of the furnishing, performance or use of any product covered by this agreement whether such claim is based upon warranty (express or implied), contract, strict liability, negligence or otherwise.

Updates or Modifications

Juniper Systems shall be under no obligation to update or modify its products except as herein noted to correct program errors. Furthermore, the customer agrees that all representations and warranties contained herein shall be immediately null and void in the event of any modification, alteration or change in or to any product affected by or on behalf of the customer except for a change made by Juniper Systems.

Removal of Serial Number

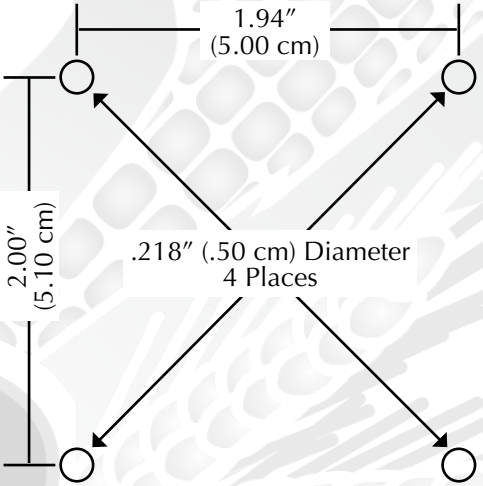
Removal of the Juniper Systems serial number label from an instrument will void any warranty on the said instrument. Juniper Systems will not repair or update an instrument and return it to an individual if the instrument is without the said serial number label.

Extended Warranties

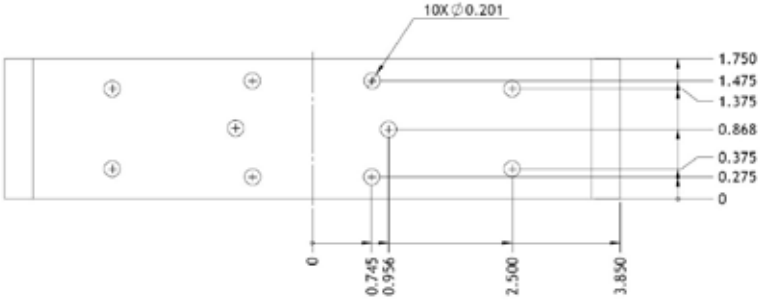
Juniper Systems offers a variety of warranty options to extend coverage beyond the standard warranty. You can contact Juniper Systems Customer Service Department for details at (435) 753-1881 (6 am - 5 pm MST, Mon-Fri).

Appendix B
Mounting Diagrams

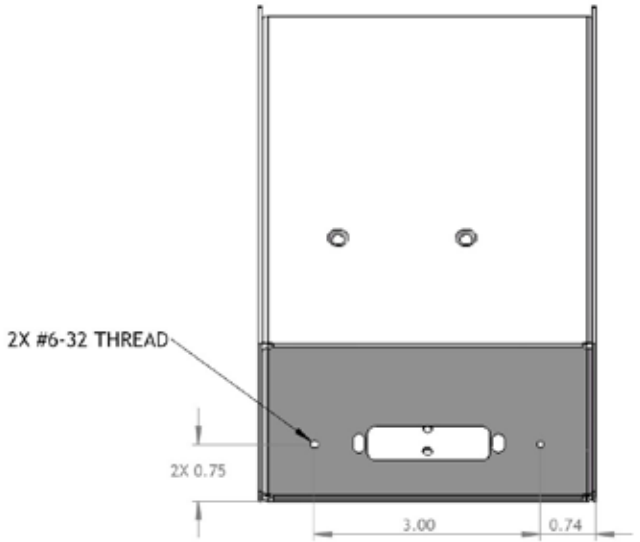
This diagram shows placement for mounting the Field Computer cradle.

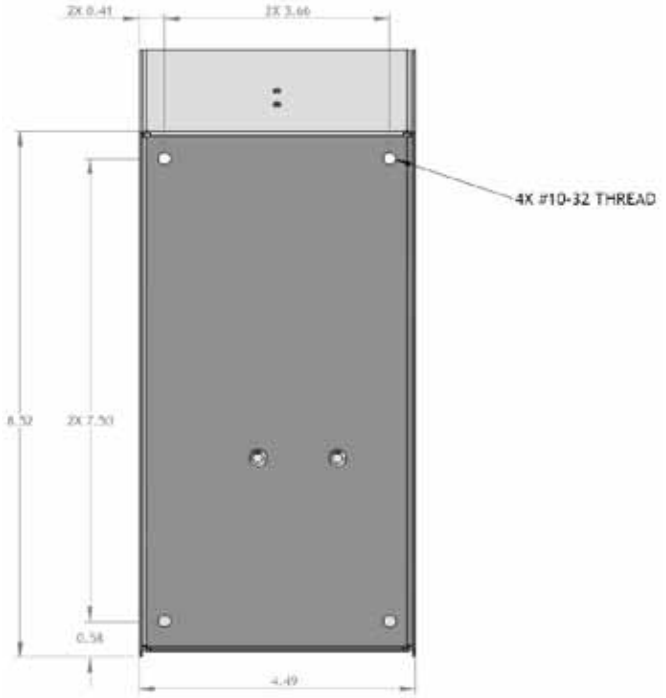


Below is pictured the system console mounting diagram.

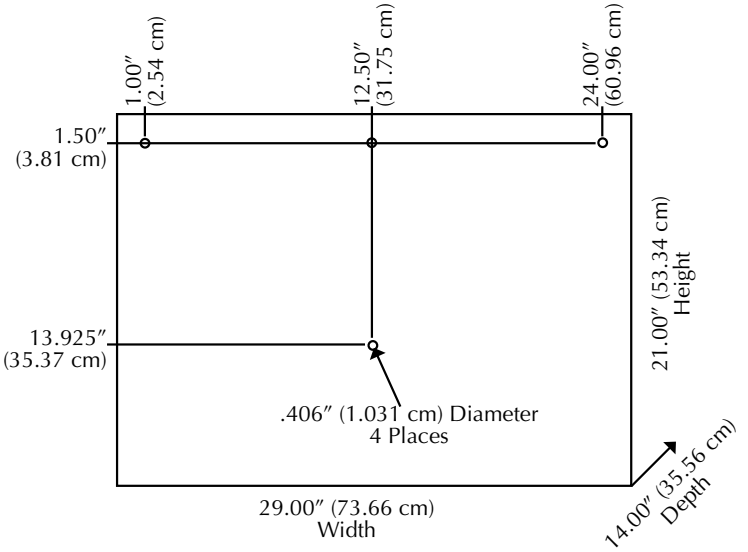


The next two diagrams are for mounting the printer.





The following diagrams are for mounting the Classic GrainGage.



Appendix C

Cable Wiring Diagrams for the HM-800

Cable Connections for HM-800

Within the HM-800 there are several components. Figure C-1 shows the components wired on the stand.

Figure C-1: Front view of HM-800 components

Figure C-2 shows the cable connections from the HM-800 System Console and modules to other components.

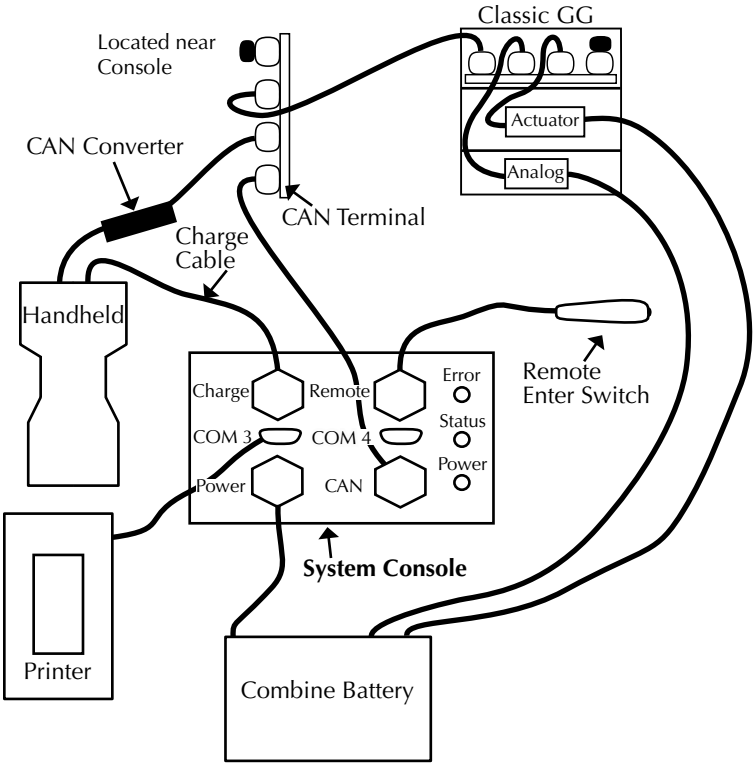


Figure C-2: Cable connections for the HM-800

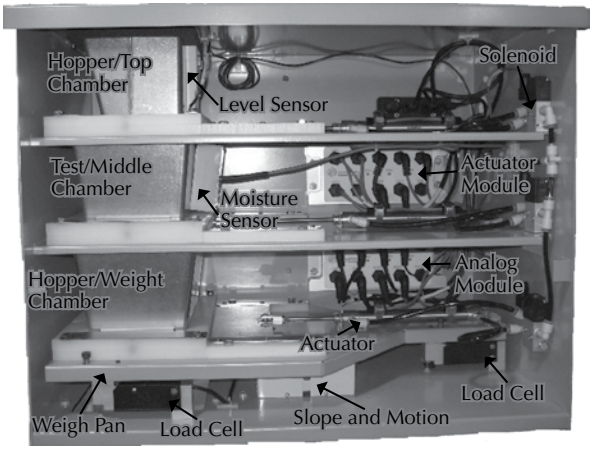


Figure C-3: Basic Classic GrainGage System

ACTUATOR

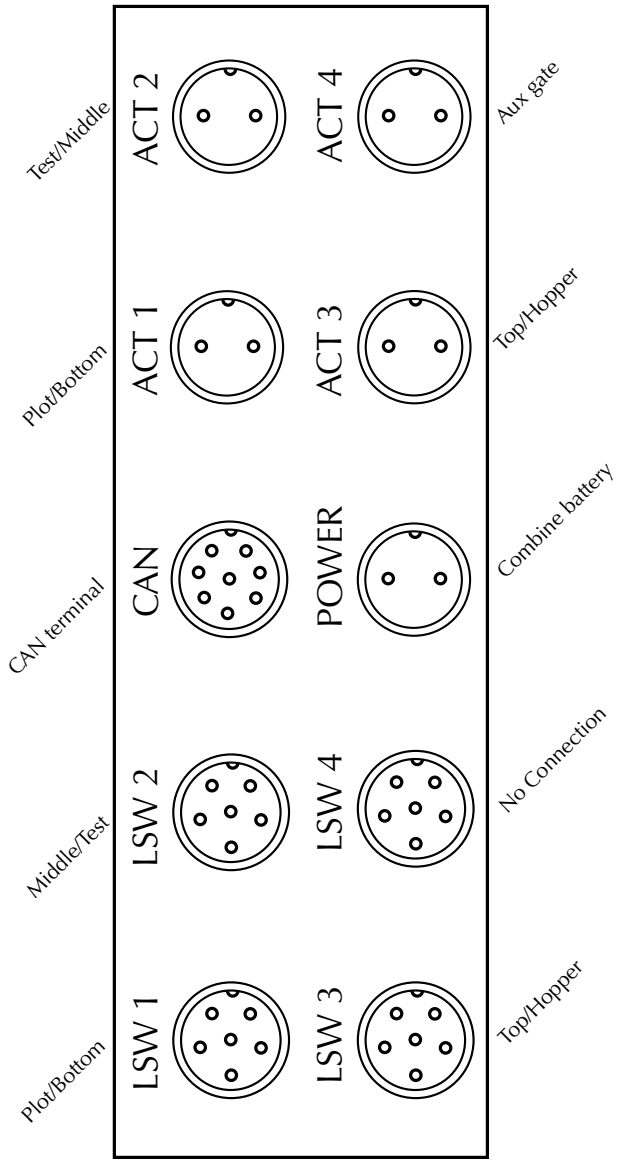


Figure C-4: Cable connections for the actuator module

ANALOG

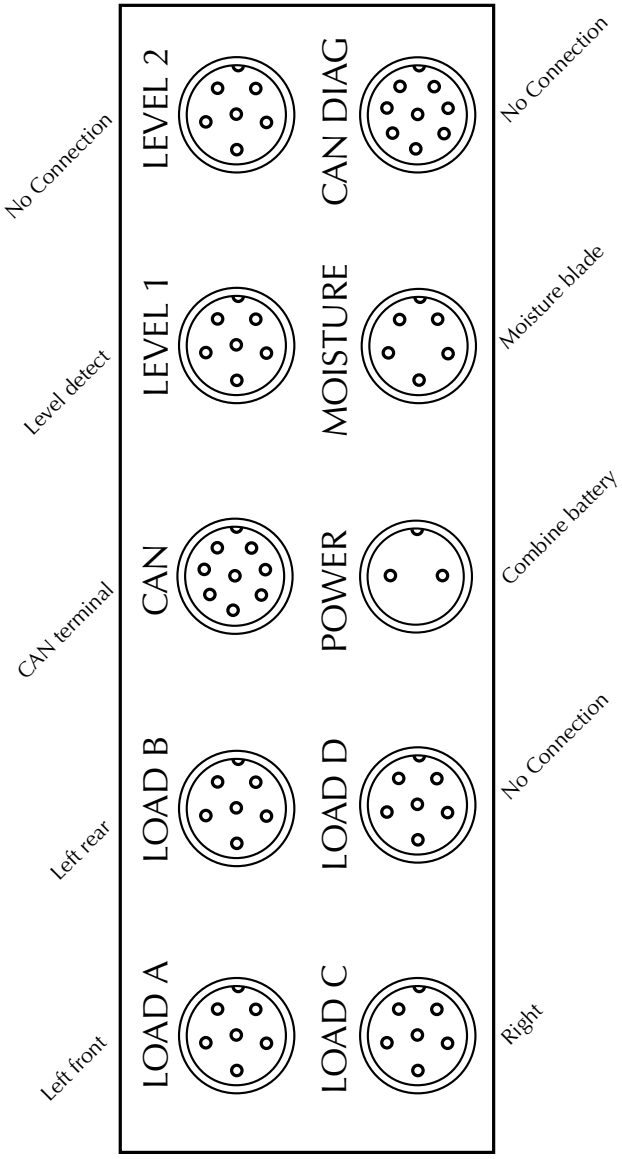
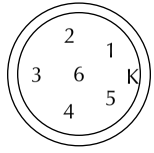


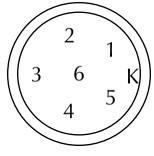
Figure C-5: Cable connections for the analog module

Appendix D: Connector Wiring Diagrams for the HM-800

Analog Module	*Classic*	*Pin*	*Connection*	*Description*
Level 1 *6 pin*	Level Detect	1	Red	Excite
		2	Shield	Ground
		3	Black	Digital In
		4	N/C	N/C
		5	N/C	N/C
		6	N/C	N/C

Analog Module	*Classic*	*Pin*	*Connection*	*Description*
Level 2 *6 pin*	N/A	1	Red	Excite
		2	Shield	Ground
		3	Black	Digital In
		4	N/C	N/C
		5	N/C	N/C
		6	N/C	N/C
Load A *6 pin*	Front Left Load Cell	1	Green	Excite
		2	N/C	N/C
		3	Red	Signal +
		4	White	Signal –
		5	Black	Excite Gnd
		6	Shield	Chassis Gnd
		N/C	Brown	N/C
		N/C	Blue	N/C





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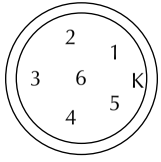
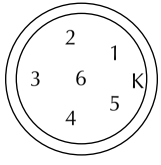
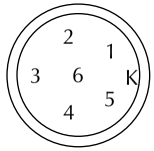
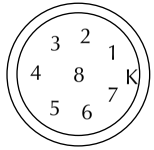
Analog Module	*Classic*	*Pin*	*Connection*	*Description*
Load B *6 pin*	Back Left Load Cell	1	Green	Excite
		2	N/C	N/C
		3	Red	Signal +
		4	White	Signal –
		5	Black	Excite Gnd
		6	Shield	Chassis Gnd
		N/C	Brown	N/C
		N/C	Blue	N/C
Load C *6 pin*	Right Load Cell	1	Green	Excite
		2	N/C	N/C
		3	Red	Signal +
		4	White	Signal –
		5	Black	Excite Gnd
		6	Shield	Chassis Gnd
		N/C	Brown	N/C
		N/C	Blue	N/C





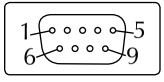
Analog Module	*Classic*	*Pin*	*Connection*	*Description*
Load D *6 pin*	External SMS	1	Green	Excite
		2	N/C	N/C
		3	Red	Signal +
		4	White	Signal –
		5	Black	Excite Gnd
		6	Shield	Chassis Gnd
		N/C	Brown	N/C
		N/C	Blue	N/C
CAN *8 pin*		1	Red	CAN Power
		2	Yellow	CAN +
		3	Black	CAN Gnd
		4	Green	CAN –
		5	N/C	N/C
		6	N/C	N/C
		7	N/C	N/C
		8	N/C	N/C

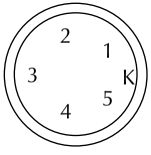


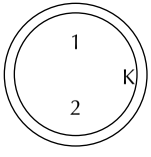


FIELD RESEARCH SOFTWARE

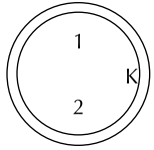
Analog Module	*Classic*	*Pin*	*Connection*	*Description*
CAN-DIAG *8 pin*	CAN	1	Red	CAN Power
		2	Yellow	CAN +
		3	Black	CAN Gnd
		4	Green	CAN –
		5	N/C	N/C
		6	N/C	N/C
		7	N/C	N/C
		8	N/C	N/C
Moisture *5 pin*	Moisture EM Sens	1	Red	Excite
		2	Black	Ground
		3	Green	Signal +
		4	White	Signal –
		5	Shield	Ground
Power *2 pin*	Power	1	Black	Ground
		2	Red	+12 V

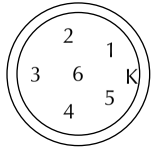




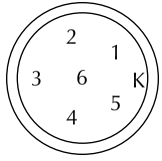


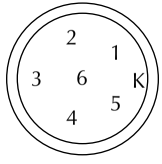
Actuator Module	*Classic*	*Pin*	*Connection*	*Description*
Act 1 *2 pin*	Bottom Plot Act	1 2	Red Black	Power Ground
Act 2 *2 pin*	Middle Test Act	1 2	Red Black	Power Ground
ACT 3 *2 pin*	Top/Hopper Act	1 2	Red Black	Power Ground
Act 4 *2 pin*	Aux Act	1 2	Red Black	Power Ground
LSW 1 *6 pin*	Bottom Plot LSW	1 2 3 4 5 6	Red Black White N/C N/C N/C	Excite Ground Signal N/C N/C N/C

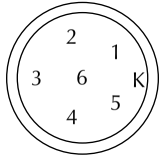




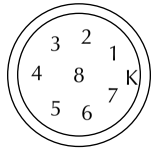
Actuator Module	*Classic*	*Pin*	*Connection*	*Description*
LSW 2 *6 pin*	Middle/Test LSW	1	Red	Excite
		2	Black	Ground
		3	White	Signal
		4	N/C	N/C
		5	N/C	N/C
		6	N/C	N/C
LSW 3 *6 pin*	Top/Hopper LSW	1	Red	Excite
		2	Black	Ground
		3	White	Signal
		4	N/C	N/C
		5	N/C	N/C
		6	N/C	N/C
LSW 4 *6 pin*	N/A	1	Red	Excite
		2	Black	Ground
		3	White	Signal
		4	N/C	N/C
		5	N/C	N/C
		6	N/C	N/C

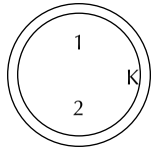




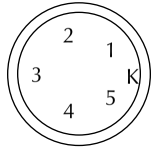


Actuator Module	*Classic*	*Pin*	*Connection*	*Description*
CAN *8 pin*	CAN (patch Cable)	1 2 3 4 5 6 7 8	Red Yellow Black Green N/C N/C N/C N/C	CAN Power CAN + CAN Gnd CAN – N/C N/C N/C N/C
Power *2 pin*	Power	1 2	Black Red	Ground +12 V



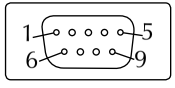


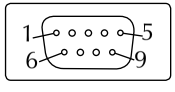
System Console	*Classic*	*Pin*	*Connection*	*Description*
Allegro Power *2 pin*		1 2	Stria Black	+12 V Ground
Remote *5 pin*		1 2 3 4 5	Black Green Red N/C N/C	Input Ground Power N/C N/C



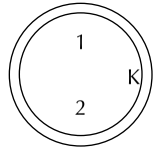
FIELD RESEARCH SOFTWARE

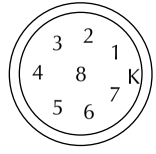
System Console	*Classic*	*Pin*	*Connection*	*Description*
Com 3	Printer	1	N/C	N/C
		2	RXD	Receive Data
		3	TXD	Transmit Data
		4	DTR	Data Terminal Ready
		5	GND	Ground
		6	DSR	Data Set Ready
		7	RTS	Request to Send
		8	CTS	Clear to Send
		9	N/C	N/C
Com 4		1	N/C	N/C
		2	RXD	Receive Data
		3	TXD	Transmit Data
		4	DTR	Data Terminal Ready
		5	GND	Ground
		6	N/C	N/C
		7	RTS	Request to Send
		8	CTS	Clear to Send
		9	RI	Ringing In





System Console	*Classic*	*Pin*	*Connection*	*Description*
Power *2 pin*	Power	1 2	Black Red	Ground +12 V
CAN *8 pin*	CAN	1 2 3 4 5 6 7 8	Red Yellow Black Green N/C N/C N/C N/C	CAN Power CAN + CAN Gnd CAN – N/C N/C N/C N/C





Appendix E

FRS Update for Allegro CX

Important notes

The process of updating FRS will erase all data associated with the current installation of FRS on the handheld. Please review the items in this section to understand which data is at risk and be sure to make backup copies so that you can restore files that are critical to your FRS setup. Please review the RELEASE NOTES associated with the latest software version located on the HarvestMaster website. These notes will recommend optimal settings and instructions to maximize the efficiency of your Harvest Data System.

This update will:

- Remove all existing versions of FRS stored on your handheld.
- Remove the FRS database on the handheld. This includes field maps, customized trait list, trait templates, and other associated data. This data needs to be exported and saved so that they can be imported back into FRS after the new software is installed.
- Erase special harvest script files (GHM, Kincaid air diverter, Wintersteiger subsampler, etc.). These instructions will guide you through how to either download the latest script file,

or save your original script files and import them into the newest version of FRS.

- Erase the harvest calibrations and handheld settings, including load cell coefficients, chamber volumes, actuator settings, level detect sensor settings, timers, and moisture curves. In order to avoid having to recalibrate after the update, be sure to record the current harvest calibrations and handheld settings so that they can be entered in FRS after the update.

Requirements

- Original FRS Note Taking serial number and registration codes found on the back of CD case or laminated card sent at the time of purchase
- Allegro CX Field PC
- Microsoft ActiveSync (for Windows XP) or Windows Mobile Device Center (for Windows Vista)
- Either a USB Power Dock (recommended)

Saving your original script file

There may be an updated version of your script file. Please consult our website to determine if this is the case. If so, then you will not need to worry about saving your original script file.

1. Go to ***My Computer > C_Drive > FRS*** on handheld.
2. Go into your Harvest Module's folder.

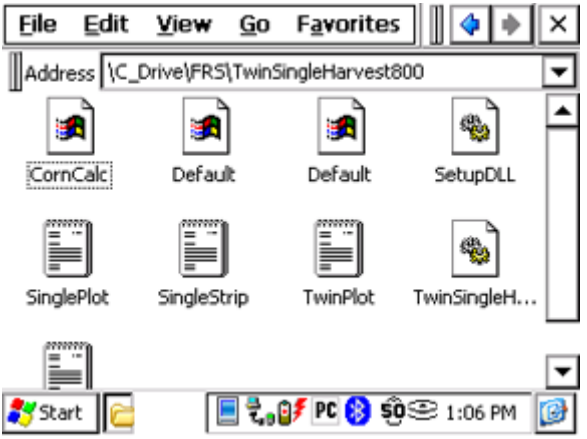


Figure E-1: Select module folder

3. Hold Ctrl on the handheld keyboard and select the appropriate text files by tapping once on each file. Text files are represented by an icon of a notebook.
4. Click ***Edit***; click ***Copy***
5. Go back to C:_Drive and go into ***C_MyDocs***.
6. Click ***Edit***; click ***Paste***.

Removing and Installing Latest Version of FRS and Related Firmware

Removing FRS and Firmware on Handheld

1. Tap on ***Start > Settings > Control Panel.***

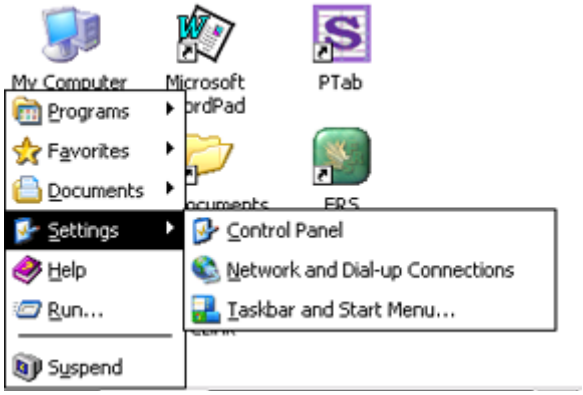


Figure E-2: Select Control Panel

2. Scroll down to ***Remove Programs***. Press ***ENTER***.

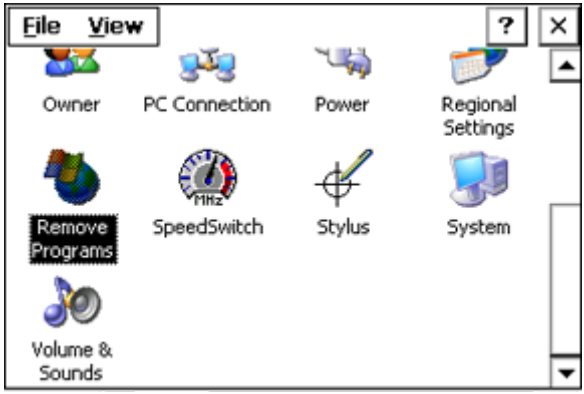


***Figure E-3: Select* Remove Programs**

3. Choose to remove the Harvest Module.

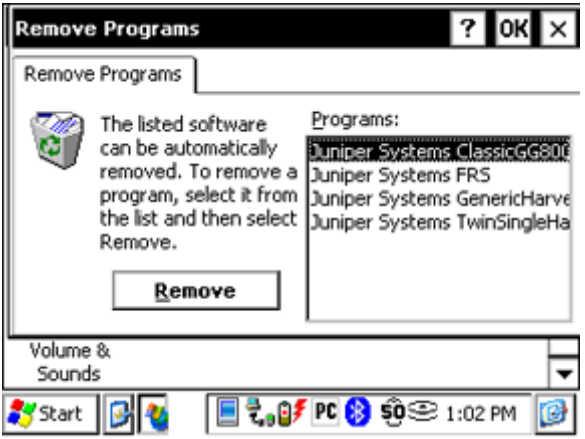


Figure E-4: Select program to remove

4. Confirm your intention to remove the program.
5. Choose to remove ***FRS Notes***.
6. Confirm your intention to remove the program.
7. Choose to remove all application data.
8. Go to ***My Computer*** on handheld's desktop.
9. Open ***C_Drive.***

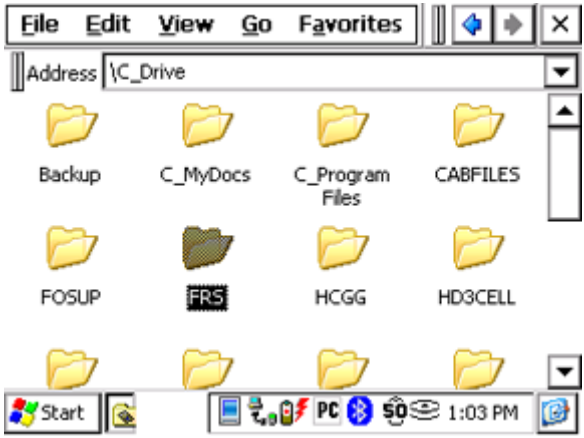


Figure E-5: Delete FRS folder

10. Delete ***FRS*** folder.
11. Choose ***Yes*** to whatever questions it asks about removing files.

Set handheld to factory defaults

This action will remove any other programs you have loaded onto the handheld

1. Select ***Start > Programs > Utilities > Set Factory Defaults.***
2. Click ***Yes.***
3. Recalibrate the touch screen.
4. Enter the last known battery charge.

Downloading and Installing Updated FRS

1. Visit http://www.harvestmaster.com/updates.
2. Download the FRS Note Taking EXE file, making sure you select the correct version of the software for your handheld OS (ex. CX vs. MX).
3. Make an Activesync or Mobile Device Center connection between your handheld and PC.
4. Run FRS Note Taking setup on PC.
5. Choose installation location on PC.
6. Choose ***Yes*** to allow program to install in default location on handheld.
7. Give it a minute or two to download onto your handheld.
8. Run FRS on handheld.
9. Enter name and previously obtained serial number, and registration key.

Downloading and Installing Harvest Module

1. Visit http://www.harvestmaster.com/updates.
2. Download CAB file associated with your harvest module and correct handheld OS (example: 400 vs. 800 and CX vs. MX).
3. Make an Activesync or Mobile Device Center connection between your handheld and PC.
4. Click Explore (XP) / File Management (Vista).
5. Click and drag the CAB file from the PC to the handheld to a

location where you can find later with File Explorer.

6. Allow file to convert to handheld format.
7. Run file on handheld.
8. Tap ***OK*** to allow program to install in default location on handheld.

HM-800 Users:

- For HM-800 Systems, the firmware must be manually updated using a utility on the handheld. Follow the steps below to complete the HM-800 update.
- Using both the battery with a full charge and the external power cord is ideal before updating the firmware. Also make sure the Auto suspend is disabled (***Start>Settings>Control Panel>Power>Schemes***). If you do not have an external power cord, you can use the Console charge cord. Failure to power the Allegro during the full firmware update process could lock the Console module.

Updating HM-800 Firmware

1. Connect handheld to Harvest Data System.
2. Open ***My Computer> C_Drive> FRS> Firmware***.
3. Run ***HM-800 Updater.***

Figure E-6:Select **HM-800 Updater**

4. Choose the file that contains the updated information.

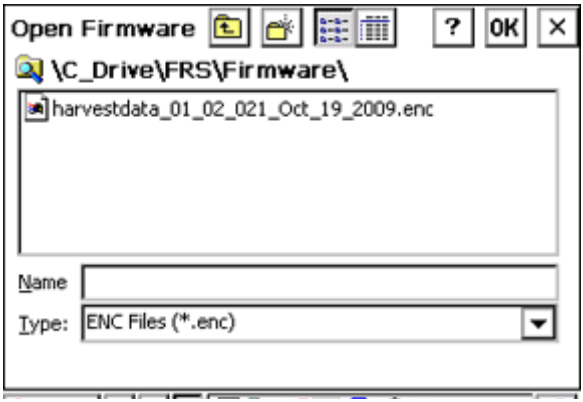


Figure E-7:Select .enc file

5. Select the module you wish to update.

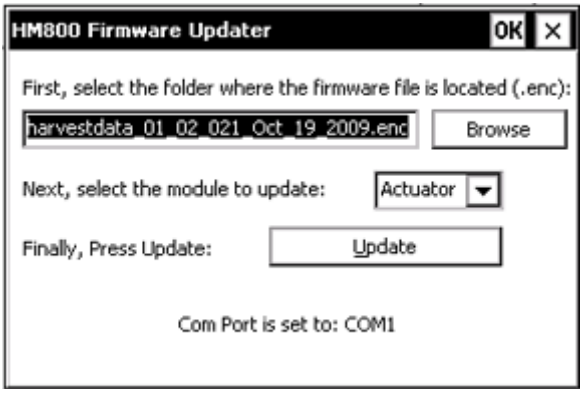


Figure E-8: Select module to update

6. Click on ***Update*** and it will show the current firmware version installed and give you the option of continuing.
7. If the versions do not match and the current firmware version is older than the new firmware version, select ***Yes***.

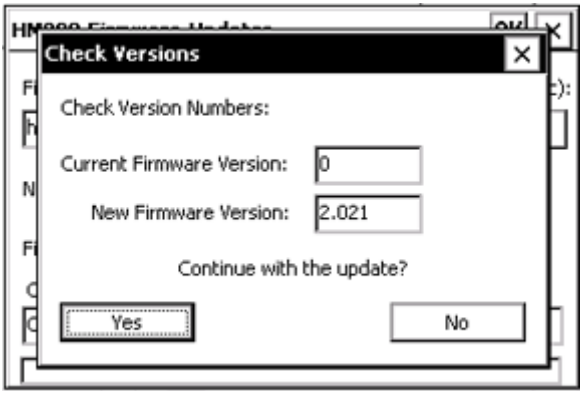


Figure E-9: Continue update

8. Continue the firmware update for all HM-800 modules.

When the firmware update is complete, open FRS and type

in your calibration settings that were previously recorded. If you never changed the transition timers on the actuators, we recommend leaving them at default to speed up operation. Verify the calibration and operation of the system. You will also need to import any data that you exported earlier such as maps, customized trait list, trait templates, existing data, etc. Refer to chapter 7 of the FRS Field Reference Guide: Note Taking manual for further instructions on importing and exporting files.

After installing the software and getting everything set up, go to ***Start > Programs > Utilities > Save System***. This will permanently burn FRS to the permanent storage and will not lose the program if the battery runs dead.

Replacing the original script files

If there are no updated script files specified in the release notes,you can now copy/paste the original script files from the storage folder into the new harvest module folder .

1. Go to ***My Computer > C_Drive > C_MyDocs.***
2. Hold ***Ctrl*** on the handheld's keyboard and click all the text files there.
3. Click ***Edit***; click ***Cut.***
4. Go into ***C_Drive > FRS.***
5. Go into your Harvest Module's folder.
6. Click ***Edit***; click ***Paste*** and answer ***yes*** when prompted.

If there are updated script files, download them from the website and paste them into your harvest module folder as previously instructed from steps five to seven.

Updating Datalink for FRS

1. First you will need to uninstall the original version of Datalink for FRS off of your PC.
2. After uninstalling the original Datalink for FRS, visit http://www.harvestmaster.com/updates and download the latest version of Datalink for FRS.
3. Run and install this latest version and your Datalink for FRS will be updated and compatible with the latest Datalink for FRS version.

Appendix F

FRS Update for Laptop

Important notes

The process of updating FRS will erase all data associated with the current installation of FRS on the laptop. Please review the items in this section to understand which data is at risk and be sure to make backup copies so that you can restore files that are critical to your FRS setup. Please review the RELEASE NOTES associated with the latest software version located on the HarvestMaster website. These notes will recommend optimal settings and instructions to maximize the efficiency of your Harvest Data System.

This update will:

- Remove all existing versions of FRS stored on your laptop.
- Remove the FRS database on the laptop. This includes field maps, customized trait list, trait templates and other associated data. This data need to be exported and saved so that they can be imported back into FRS after the new software is installed.
- Erase special harvest script files (GHM, Kincaid air diverter, Wintersteiger subsampler, etc.). These instructions will guide you through how to either download the latest script file, or save your original script files and import them into the newest version of FRS.

- Erase the harvest calibrations and laptop settings, including load cell coefficients, chamber volumes, actuator settings, level detect sensor settings, timers, and moisture curves. In order to avoid having to recalibrate after the update, be sure to record the current harvest calibrations and handheld settings so that they can be entered in FRS after the update.

Requirements

- Original FRS Note Taking serial number and registration codes at the time of purchase
- Laptop PC running Windows XP, Vista or 7(minimum resolution of 1280 x 1024)
- Full administration rights to install software on Laptop (contact your network administrator if you do not have administration rights)
- Microsoft ActiveSync (for Windows XP) or Windows Mobile Device Center (for Windows Vista)

Saving your original script file

1. Select ***Start Menu>Programs>Juniper Systems> FRS>Harvest Module Folder***.
2. Copy the appropriate text files from this folder and paste into a folder outside of the FRS program.

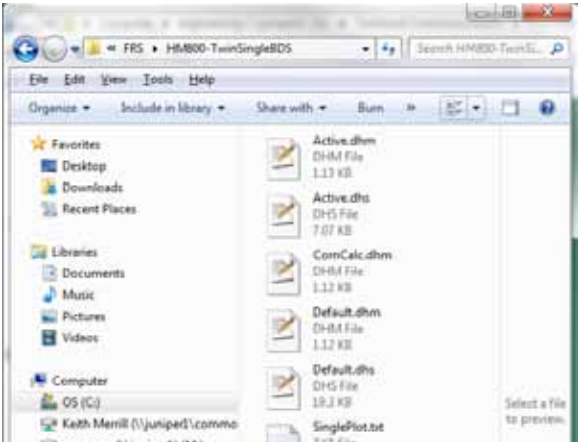


Figure F-1: Harvest Module Script Files'

Removing and Installing Latest Version of FRS and Related Firmware

Removing FRS and Firmware on Laptop.

1. Select ***Start Menu > Programs >Juniper Systems > FRS >Uninstall.***
2. When uninstall is selected, you will be prompted to confirm your selection.
3. Select ***Uninstall*** to begin the process.

Loading updated version of FRS laptop.

1. Visit ***http://www.harvestmaster.com/HarvestMaster/support/Downloads/FRS-Suite.***
2. Select ***FRS 2.2 Laptop for harvest systems***..

3. Select your harvest system type (HCGG, CGG, GHM).
4. Select MAIN SOFTWARE (Note Taking) and download this first.
5. You will now be prompted to RUN the software and it will begin installing.
6. You will then be prompted to choose components that you want to install with the program. Default is all checked.
7. Select ***Next***. You may choose an install location, but default location is automatic. Click ***Install***.
8. Once installation is complete, you should see an FRS icon on your desktop.

Loading update Harvest Module software

1. Return to the website and download the appropriate Harvest Module for your application.
2. Once, downloaded, run the install software and follow the same prompts as the note-taking software.

HM-800 Users: Firmware Update

- The firmware must be updated manually using a utility that was installed with the software. Follow the steps below to complete the HM-800 Firmware update.
- It is critical that the laptop's battery is fully charged and the external power cord is connected before updating firmware. If a power failure occurs to the laptop during the firmware update process, the system console will become locked.

1. Connect laptop to Harvest Data System.
2. Select ***Start Menu >Programs >Juniper Systems >FRS>Data Folder >Firmware***.
3. Select the Firmware Utility.

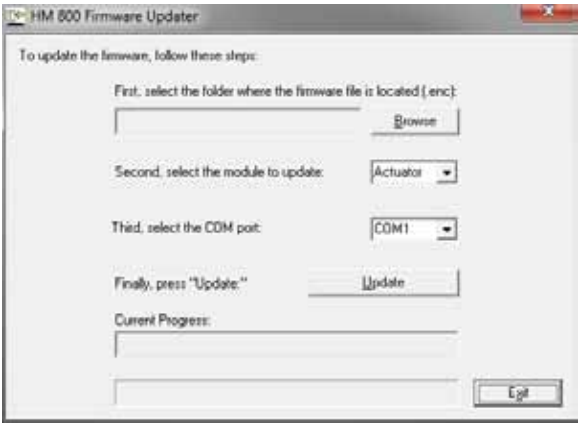


Figure F-2: HM Update screen

4. Select ***Browse***, and then select the ENC. file from the window.
5. Select the module to update.
6. Select your COM port. You may have to configure your laptops com port settings.
7. Select ***UPDATE.***

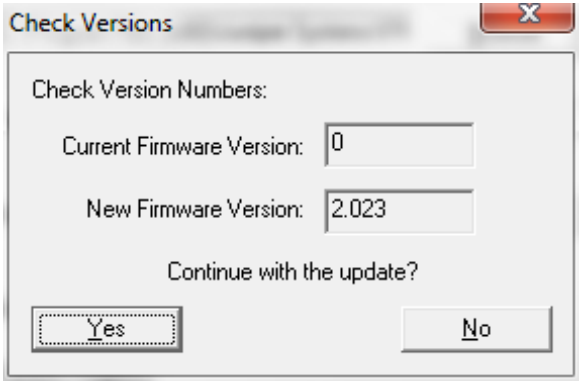


Figure F-3: Check Version screen

8. The Firmware updater will check the current versions and prompt you to continue with update. Select YES to load current firmware.
9. Continue update on all HM-800 modules on your system.

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