CHAPTER 4

OPERATION AND TESTING OF THE GAC2500-UGMA

4.1 APPROVED CALIBRATIONS

Refer to Program Directive 9180.61, Official Moisture Meter Calibrations, for a listing of official calibrations, and meter models that can be used for specific grain types.

4.2 ENVIRONMENTAL CONDITIONS

UGMA meters should be operated in relatively controlled and clean environments where:

a. Room temperatures are within 45-100 °F (7-38 °C). To reduce the chance for error codes and minimize the effects of temperature in official inspection, it is recommended that the room temperature be maintained within the range of 60-85 °F (15-30 °C).

b. The instrument is placed on a level surface. Ensure the instrument is level using a minimum 6 inch carpenter level.

c. The instrument is not subjected to perceptible vibrations when in operation.

d. The instrument is not placed in close proximity to radio frequency transmitters such as mobile phones, wireless routers, two-way radios etc. Generally, no such transmitters should be operated within five feet of the instrument. If the instrument shows error messages such as “Empty Cell Measurement out of Spec,” any transmitters in the vicinity of the instrument should be moved further away from it to avoid erroneous moisture results.

4.3 MAINTENANCE

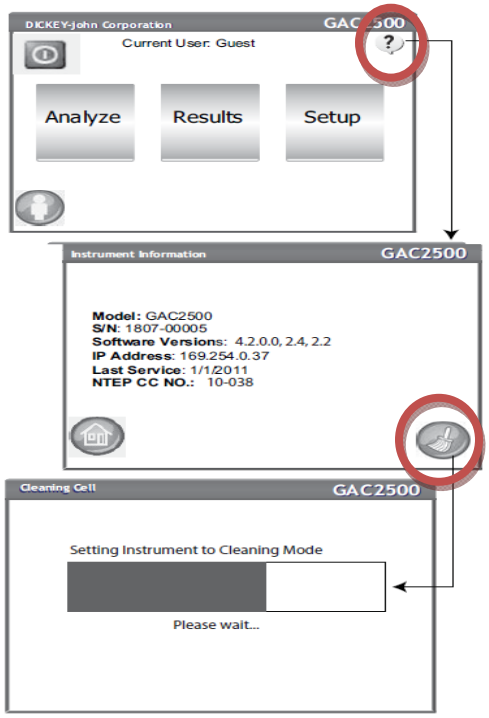
a. Cleaning Machine.

Performing continuous tests without cleaning can result in material accumulation on the external surface and around the measuring cell and adversely affect the moisture measurements. The GAC2500-UGMA must be cleaned regularly to ensure continued accurate results. A special mode is provided to assist in cleaning the cell and door.

To start the cleaning process:

(1) At the Main Menu screen, press the **Instrument Information** button.

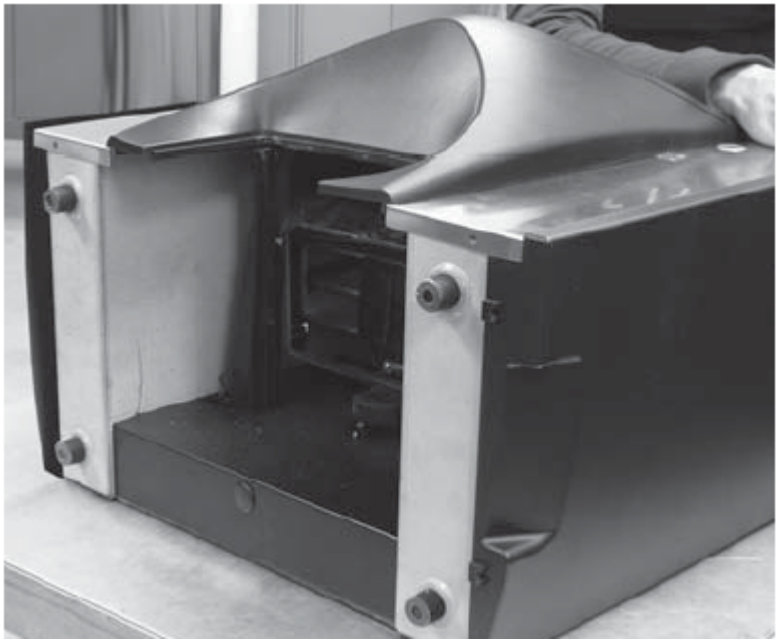
(2) At the Instrument Information screen, press the **Clean** button. Pressing the Clean button automatically begins the cleaning sequence and opens the hopper door and the dump door (version 2.4 CE/IL board firmware).



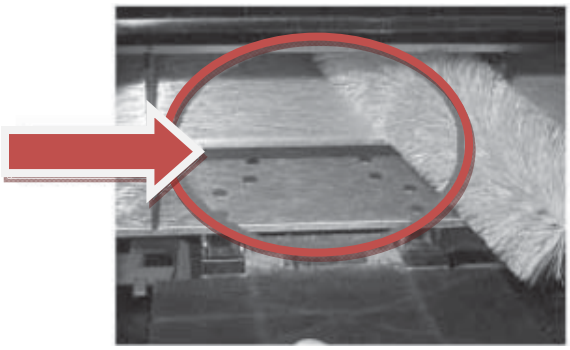
(3) Remove the grain drawer

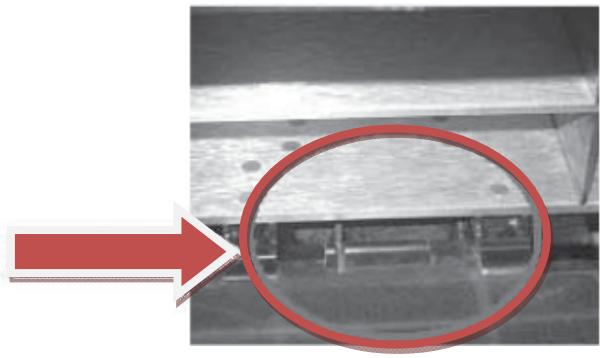
(4) Manually remove any loose or stuck grain from the measuring cell.

(5) Place the unit on back side.



(6) Clean surfaces around measurement cell including hinge, trap door, and edge of cell.

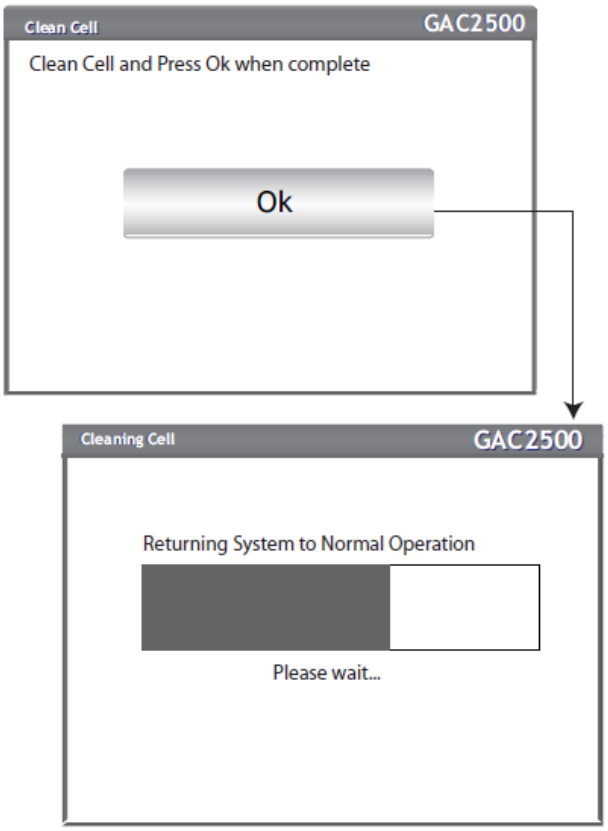




(7) When cleaning is complete, return instrument to upright position.

(8) Press the **OK** button to return instrument to normal operation.

NOTE: Hands should be clear from inside the instrument before pressing the OK button.



(9) Insert grain drawer.

b. Electrical connections. Check the condition of the power cord and connections, and ensure that a grounded plug is used.

c. Moisture Meter Record Log. A permanent log book shall be established and maintained for each GAC2500-UGMA. The book shall be kept with the meter at the official use site. The log will be used as an important historical record to indicate:

(1) Serial Number.
(2) Meter test dates, results, and comments.
(3) Date and type of each repair.
(4) Date and location for each transfer to a new site and associated weight check results
(5) Date and initials for each calibration change. (both official and unofficial).
(6) Date, time, and initials when checking audit trail, calibrations version, weight accuracy etc., following return from cross utilization.
(7) Other notable events.

Log Book Example

DATE	ACTION	NAME OF PERSON MAKING THE ENTRY
8-15-12	Rec'd s/N 11/31-20123	
	from Dickey-John	ZL
9-2-12	Returned from Repair	
	-Load Sensor	BF
9-4-12	Moved to XYZ Lab	
	Passed weight Check	BF
9-10-12	Calibration Change	ZL
9-12-12	Audit Trail Check	ZL
9-29-12	Weight Check - Passed	BF
10-15-12	Checked Calibrations for	
	Corn, Soybeans, + Sorghum	ZL

4.4 OPERATION

a. Cross-utilized Equipment. When moisture meters are used by both official agency and unofficial (elevator) personnel, the elevator shall not make any changes to the meter set-up unless approved and witnessed by the official agency. When a meter has been out of official agency control, the official agency shall clean (if necessary), follow installation guidelines (**Section 4.2**), and check the operation of the meter before commencing daily operations. This should include a weighing accuracy test, calibration version verification, and review of audit trail.

(1) Weighing Test. If the instrument was <u>not</u> tested in the most recent checktest cycle, perform the official checktest—including the "weighing accuracy test" as described in **Section 4.5** under the Check Test Instructions. Otherwise, follow the instructions below.

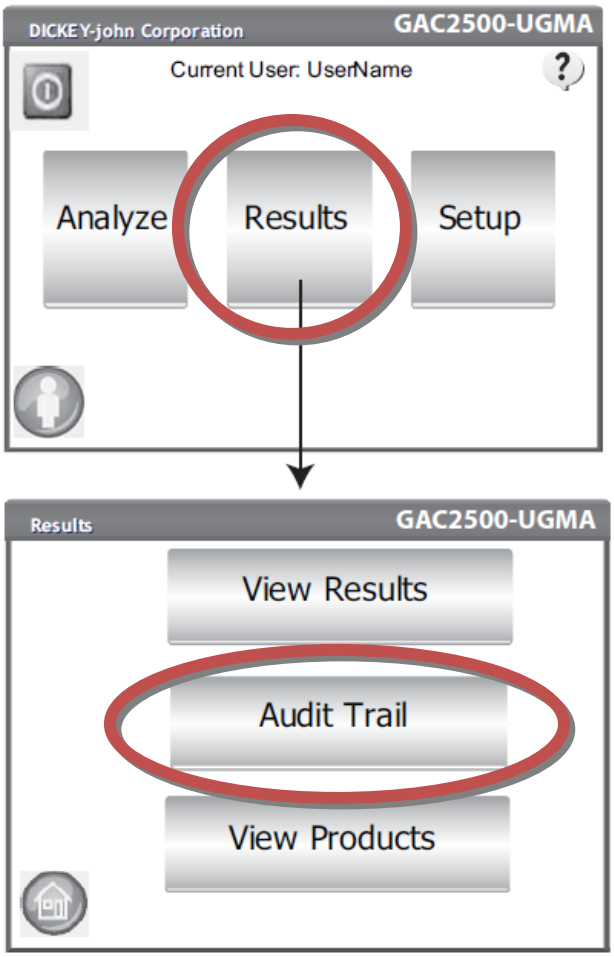
(a) Navigate to the **Check Scale** mode and proceed to test a soybean sample (use wheat if soybeans not available). After the instrument gives a weight reading, weigh the sample recovered from the test cell on an approved scale. Compare the two readings. If the difference is within +/- 1.0 gram then the machine is within tolerance (for a single test). **If it is within this tolerance proceed to verify the calibration version (Step 2), otherwise continue to Step 1(b).**

Note: If a location does not have an approved scale on site, record the weight from the meter then double-bag the grain portion (to prevent moisture weight loss) and transport the bagged portion to another laboratory for weighing on an approved scale (within 48 hrs at most). Make sure to record this event and results in the log book.

(b) Repeat step 1(a) four more times and average all 5 results. If the average difference is within +/- 0.5 grams then the machine is within tolerance. Weight errors exceeding +/- 0.5 grams require instrument repair.

(2) Calibration Version Verification. Follow instructions outlined in **Section 4.5.**

(3) Review of Audit Trail. Review the Audit Trail log and make sure there have been no system modifications while the instrument has been out of official agency control. Any changes that relate to system functionality and testing are recorded and stored on the instrument. The Audit Trail will provide a log of these changes.



b. If problems are found, remove the unit from official service until corrected. Whatever method of security check is performed, it must be recorded in the Log Book and the entry initialed.

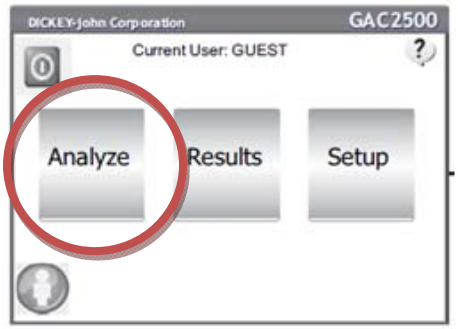
c. Maintain Current Date and Time for accurate records. (See Operators Manual)

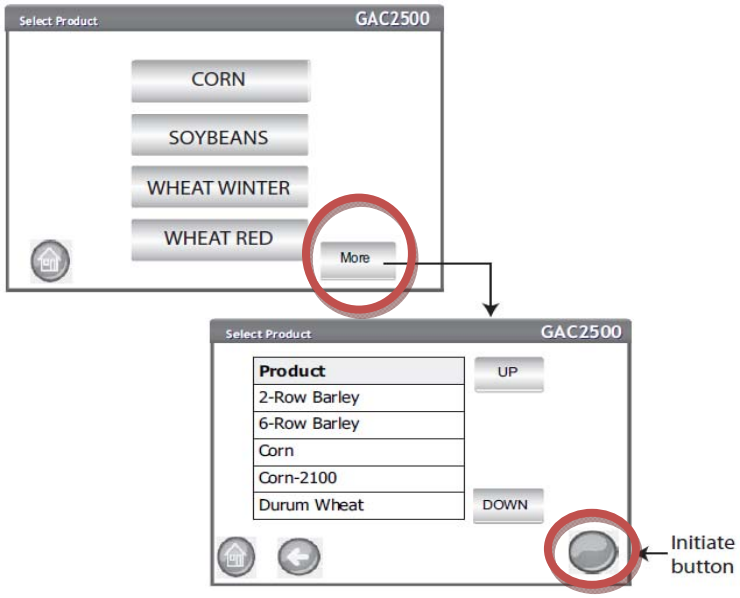
d. Test Weight per Bushel. This function is not approved for official use.

d. Power-On. The GAC2500-UGMA is powered on by pressing the On/Off switch located on the front panel (below). A series of Startup screens load after the system is turned on. A status bar will indicate self checks are occurring and, upon completion, the Instrument Information screen is displayed for several seconds before the Main Menu screen displays.

e. Grain Selection.

(1) At the Main Menu screen, press the **Analyze** button. A list of 4 grains appears on the Select Product screen. As grain types are selected during operation, the most recently used grain will appear at the top of the list.





(2) To view additional grains not viewable on the top level Select Product screen, press the **More** button.

(3) Press the **Up** and **Down** buttons to view grains.

(4) Press the desired grain in the product table.

(5) Once selected, press the **Initiate** button to accept.

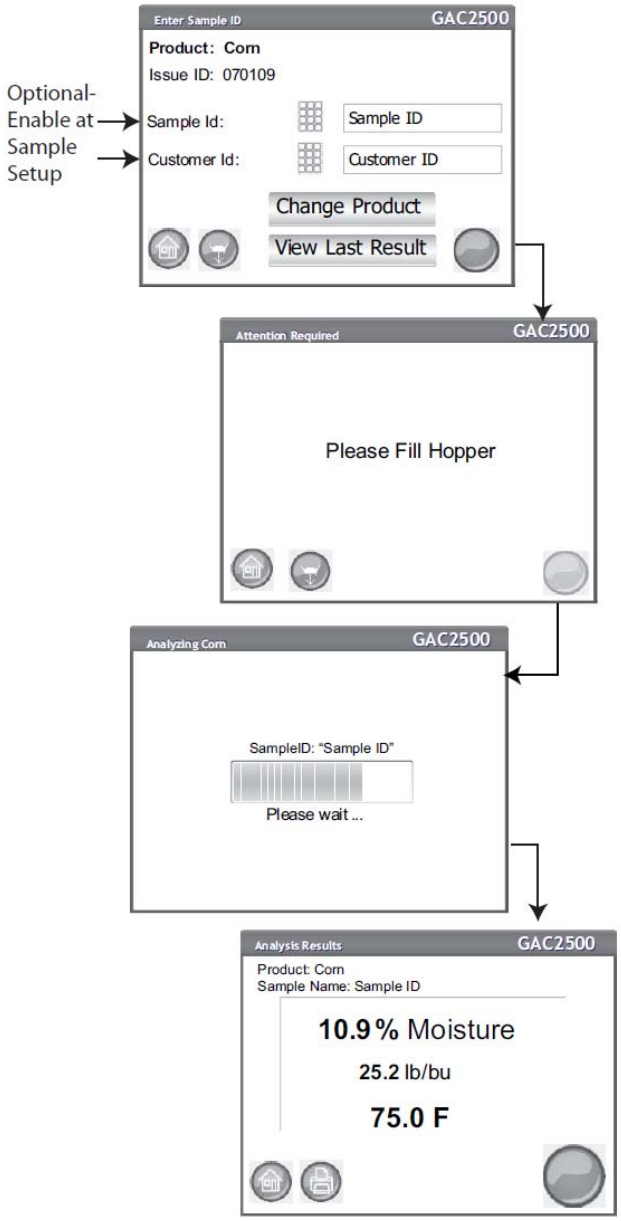
f. Grain Analysis.

(1) After the grain is selected, an optional Sample ID and Customer ID entry screen will appear. A Sample ID/Customer ID name can be entered by pressing the keypad located next to the input box.

(2) Press the **Initiate** button to proceed.

(3) Pour sufficient grain into the hopper until the grain reaches the hopper full sensors. An Error code will display if amount of sample is inadequate.

(4) Press the **Initiate** button to begin test. Grain will dump into the measurement cell from the hopper. A test will only begin when the **Initiate** button is green.



(5) The cell fills and the striker arm moves across the top of the test cell to wipe away excess grain.

(6) During analysis, a testing status bar indicates progress.

(7) An audible alarm indicates when test is complete and the Analysis Results screen appears.

NOTE: **Do not insert fingers or foreign objects into the opened hopper doors.**

(8) The Analysis Results screen displays the Selected Product Name, Sample Identification, percent Moisture Content, Test Weight, and Temperature.

(9) Addressing Suspected Erroneous Results:

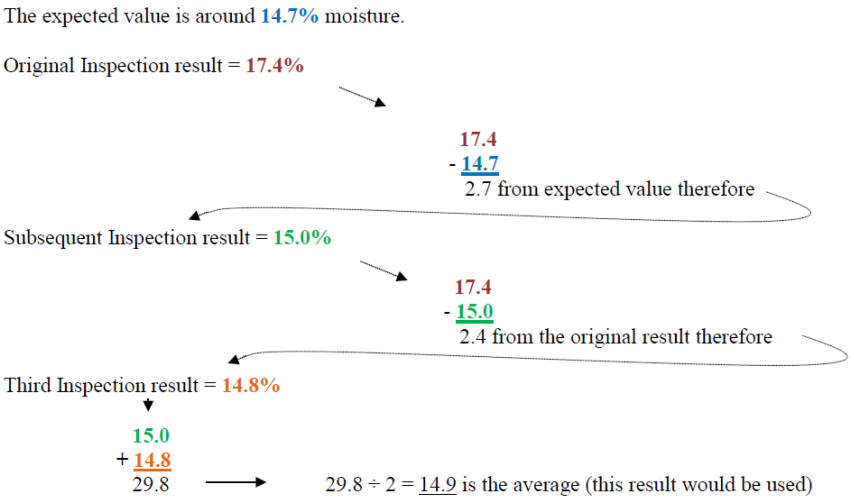
(a) If the result appears to be a gross error (meaning there is reason to believe the error is more than 2 percent moisture different from the expected value or that of a similar lot of grain), one subsequent test may be performed. (Before repeating the test, check the cleanliness of the instrument, verify that the correct calibration was selected, and remove from the sample any large debris that may have hindered the flow of grain into the test cell.)

(b) If the second test result is within 1 percent moisture of the first, report the original result

(c) If the second test result is not within 1 percent moisture of the original, perform a third test and report the average of the two results that are closest to each other.

Note: This policy may only be used when the official operator suspects that a gross error has occurred; it must <u>not</u> be used to justify retesting to obtain a desired moisture reading. The original inspection otherwise consists of one drop. The interested party may request a review and/or appeal inspection according to established procedures.

(d) Example:

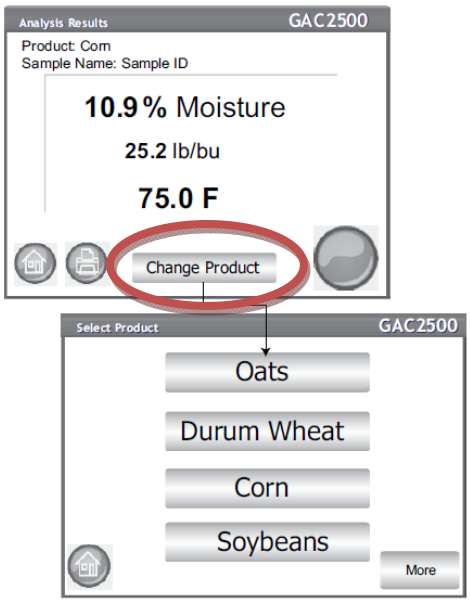


(10) To Change Product:

(a) At the Analysis Results screen, press the **Change Product** button.

(b) At the Select Product screen, choose the desired product.

(c) Proceed to fill hopper with new product.



(11) Test results are automatically saved to the unit.

(12) If the unit is set to Manual advance after each analysis, press the **Initiate** button to return to the Sample ID screen to enter the next sample name and then initiate another test.

Grain automatically dumps into the drawer after the test. Drawer capacity is approximately three tests. After three tests the drawer must be emptied before another measurement can be made.

g. Sample Temperature. The GAC2500-UGMA grain sample maximum temperature range limit is 0 to 113°F (-18 to 45°C). The moisture sample temperature is more restricted for some grain types and moisture ranges. If the grain sample has a temperature outside this range an error code will be displayed.

h. For additional instructions, refer to the GAC2500-UGMA operator's manual.

4.5 CHECK TESTING THE GAC2500-UGMA

Refer to the UGMA-Compatible Moisture Meter Checktesting Procedures, Attachments A and B for instruction:
http://www.gipsa.usda.gov/fgis/equipment.html

Refer to the UGMA-Compatible Moisture Meter Checktesting Procedures, Attachment C for the appropriate form/spreadsheet:
http://www.gipsa.usda.gov/fgis/equipment.html

If you have any questions regarding the check test contact Pat Jackson (816) 891-0450 or the Moisture Lab (816) 891-0445.

4.6 REPAIR OF OFFICIAL MOISTURE METERS

a. General. All repairs to official meters shall be made by the manufacturer. Users shall not attempt to make repairs or adjustments other than as outlined in this handbook or the GAC2500-UGMA operator's manual.

b. To aid the manufacturer in determining the types of repairs needed, thoroughly describe the malfunction or operational difficulty, and provide any other pertinent information concerning the condition of the meter.

c. When packing the meter for shipment, be sure to follow the operator's manual instruction.

d. Upon return from repair, the meter shall be check tested.