AUDIT TRAIL DEVICE SECURITY

PRESENTED BY SCOTT WAGNER

INTRODUCTION

- Audit trails accepted in 1989
- Audit trails provide more information than a lead-and wire seal
- Many benefits to users and weights and measures officials
- Weights and Measures officials and service personnel must understand
  - Audit trail format
  - Audit trail requirements
  - How to use the information from audit trails

TWO TYPES OF PARAMETERS TO BE SEALED

- Adjustment parameters:
  - Parameters whose values are expected to change as a result of accuracy adjustments
- Configuration parameters:
  - Parameters whose values are expected to be entered once only and not generally changed after all initial installation settings are made

PRINCIPLES FOR SEALING

- Need to seal depends on:
  - Ease of facilitation of fraud
  - Likelihood that fraud will not be detected
- Features/Functions used in routine operation do not need to be sealed (e.g., setting unit prices)

Table S.2.5.
Categories of Device and Methods of Sealing

Categories of Device	Methods of Sealing
Category 1: No remote configuration capability.	Seal by physical seal or two event counters: one for calibration parameters and one for configuration parameters.
Category 2: Remote configuration capability, but access is controlled by physical hardware. The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.	The hardware enabling access for remote communication must be on-site. The hardware must be sealed using a physical seal or an event counter for calibration parameters and an event counter for configuration parameters. The event counters may be located either at the individual measuring device or at the system controller; however, an adequate number of counters must be provided to monitor the calibration and configuration parameters of the individual devices at a location. If the counters are located in the system controller rather than at the individual device, means must be provided to generate a hard copy of the information through an on-site device.
Category 3: Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password). The device shall clearly indicate that it is in the remote configuration mode and record such message if capable of printing in this mode or shall not operate while in this mode.	An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to 10 times the number of sealable parameters in the device, but not more than 1000 records are required. (**Note:** Does not require 1000 changes to be stored for each parameter.)

DEFINITION OF “REMOTE” DEVICE

- Not required for the measurements operation of the primary device or to compute the transaction information (in any mode)
- Not a permanent part of the primary device
- Able to adjust another device or chance a device’s sealable configuration parameters

Measuring Devices – Example Category 1

- No remote configuration capability
- Access to adjustments/configuration only at the device
- Sealing:
  - physical seal or
  - two event counters (minimum form of audit trail)

Example: ECR/Console may authorize sales, but can NOT Remotely Configure Dispenser

ECR/Console

MEASURING DEVICES CATEGORY 2

- Remote configuration capability
- Access to remote configuration is controlled by physical hardware ON SITE
- Clear indication when in configuration mode
  - Including indication on any recorded representation

MEASURING DEVICES CATEGORY 2

- Sealing:
  - Hardware enabling access for remote communication sealed using a physical seal

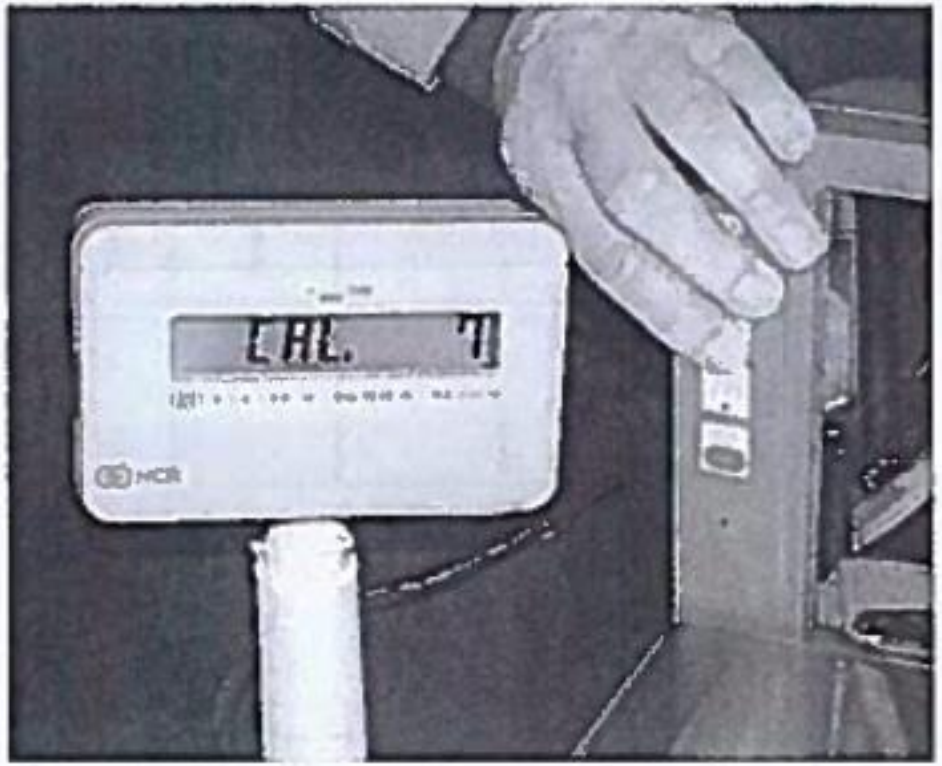
  OR

  - Device receiving parameters sealed with two event counters (calibration and configuration)
- Event counters can be located at individual measuring device or at system controller
  - Adequate number of counters required to monitor individual devices at the location
  - Means to generate hard copy of audit trail info if counters are at system controller

MEASURING DEVICES CATEGORY 3

- Remote configuration capability
- Access to configuration parameters or adjustments unrestricted or controlled through software switch (e.g. password)
- Clear indication when in configuration mode
  - Including indication on any recorded representation
- Sealing:
  - Event logger (or centralized event logger)
    - Includes event counter, parameter ID, date, time, new value
    - Printed copy available through on site device
      - Electronic copy may also be provided in addition to hard copy

Example – Viewing Scale Event Counter



Event Log – Example

Event Counter	Date	Time	Parameter Identification	New Values	Explanatory Comments
323	3/12/02	09:00	span	46.838	Span adjustment.
322	3/12/02	08:59	AZSM	1	Zero tracking range set to 1 division.
321	12/22/01	13:31	samples avg	16	Samples per update set to 16.
320	12/22/01	13:33	span	42.838	Span adjustment.
319	12/22/01	13:32	AZSM	3	Change in the zero tracking range.
318	8/17/01	14:14	AZSM	1	Zero tracking set to 1 division.
317	8/17/01	14:08	span	46.838	Span adjustment.
316	8/17/01	14:03	samples avg	4	Samples per update set to 4.
315	8/17/01	13:55	zero	520	Coarse zero (dead load) is 520 lb.
314	8/17/01	13:33	AZSM	0	Zero tracking turned off.
313	3/5/01	10:25	span	46.231	Span adjustment.

GENERAL REQUIREMENTS FOR AUDIT TRAILS

- Adjustment mode accesses only sealable parameters
- An event counter shall be able to count at least 1000 values (e.g., 000 to 999)
  - Increments only *once* while in the configuration mode regardless of the number of changes while in that mode
  - Counter increments *only* when parameter is changed
- Audit trail data shall be:
  - Stored in non-volatile memory
  - Retained for at least 30 days if power is removed
  - Protected from unauthorized erasure, substitution, or modification
- When the event logger storage capacity is full, any new events shall cause oldest event to be deleted

ACCESS TO AUDIT TRAIL INFORMATION GENERAL

- Described in the NTEP Certificate of Conformance
- Viewing or printing contents:
  - Must be “convenient”
  - Must be separate from calibration or set-up mode
  - Must not affect normal operation before of after access
  - Mar require a key to access

PHYSICAL SEAL COMPARED TO AUDIT TRAIL

- Physical seal:
  - Broken seal indicates access to the sealed features or adjustments
  - Viewed as a deterrent


CALIBRATION
DECREASE

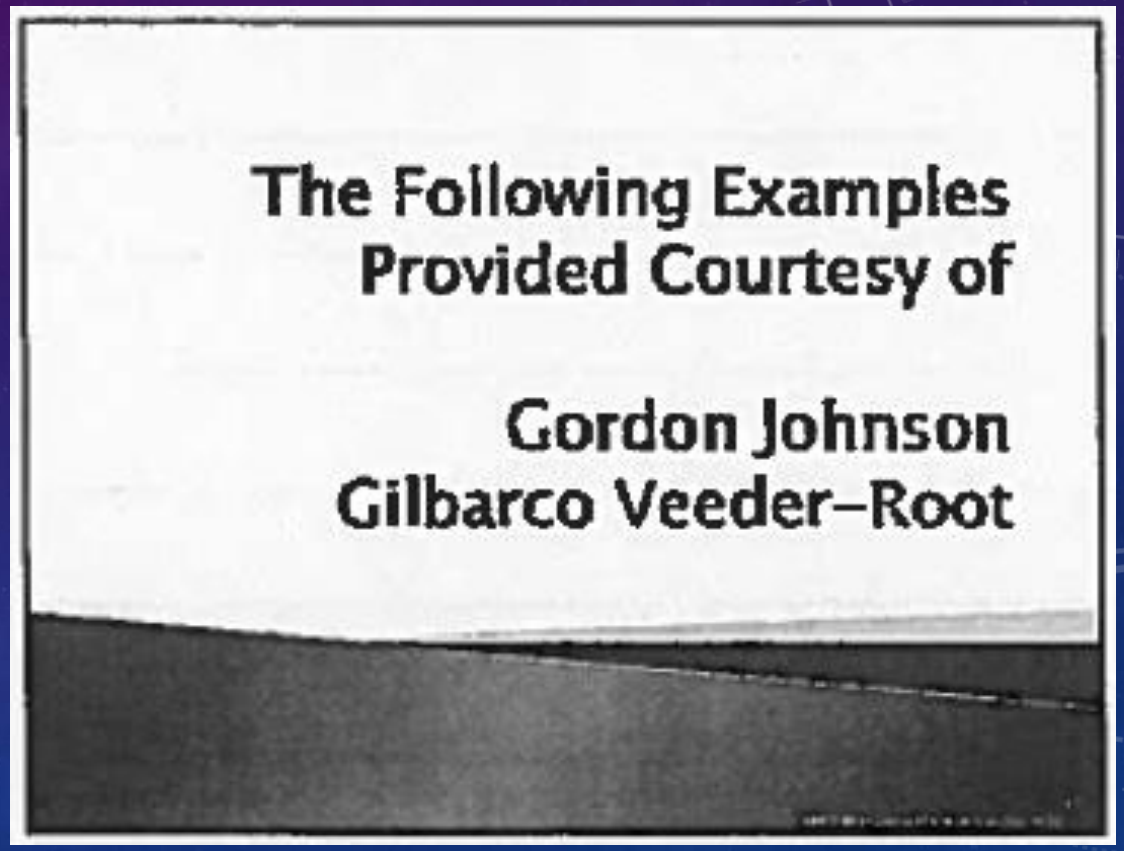

CALIBRATION
DECREASE


DECREASE

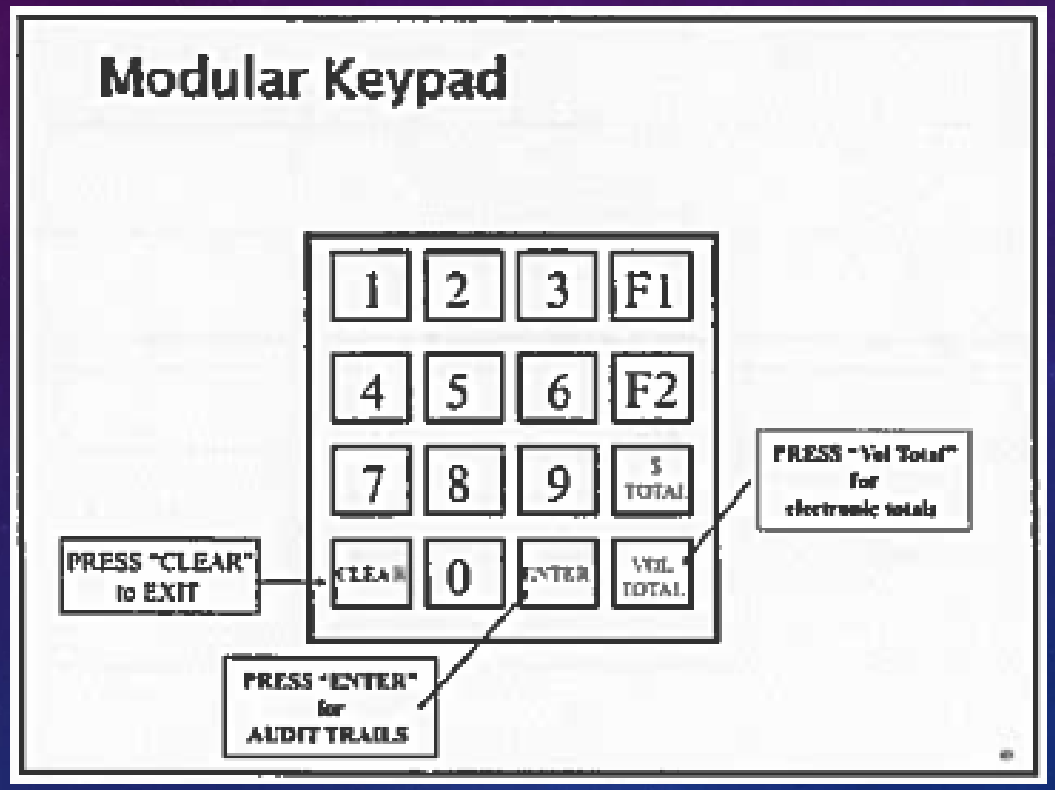
BENEFITS OF AUDIT TRAILS

- Provides industry with an alternative to physical security seals
- Provides more information than physical security seals
  - Record audit trail information on inspection report
- Device owner can use to detect employee tampering
- Evidence to weights and measures of the number, frequency, and types of changes
- Alerts inspector when investigation is necessary
- Deterrent to fraudulent manipulation of parameters

EXAMPLES OF AUDIT TRAILS



Modular Keypad

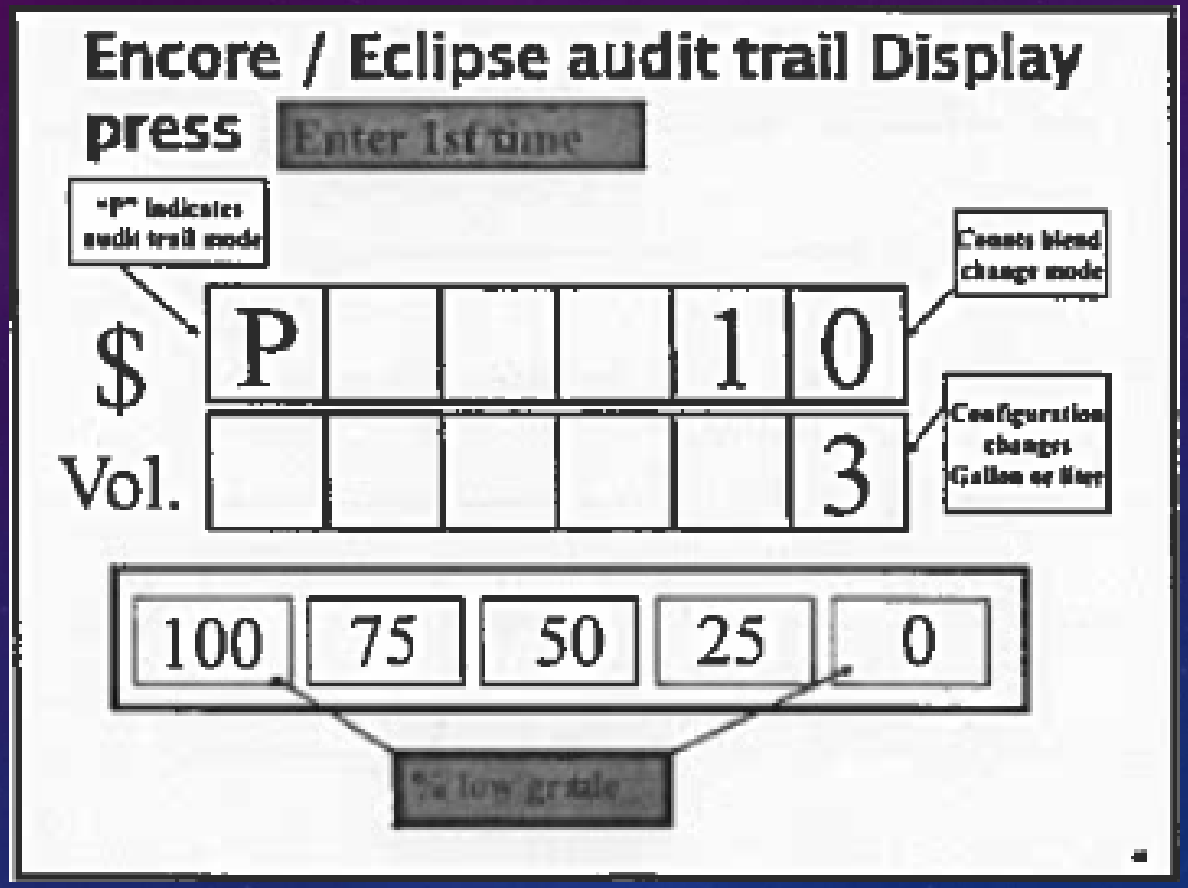


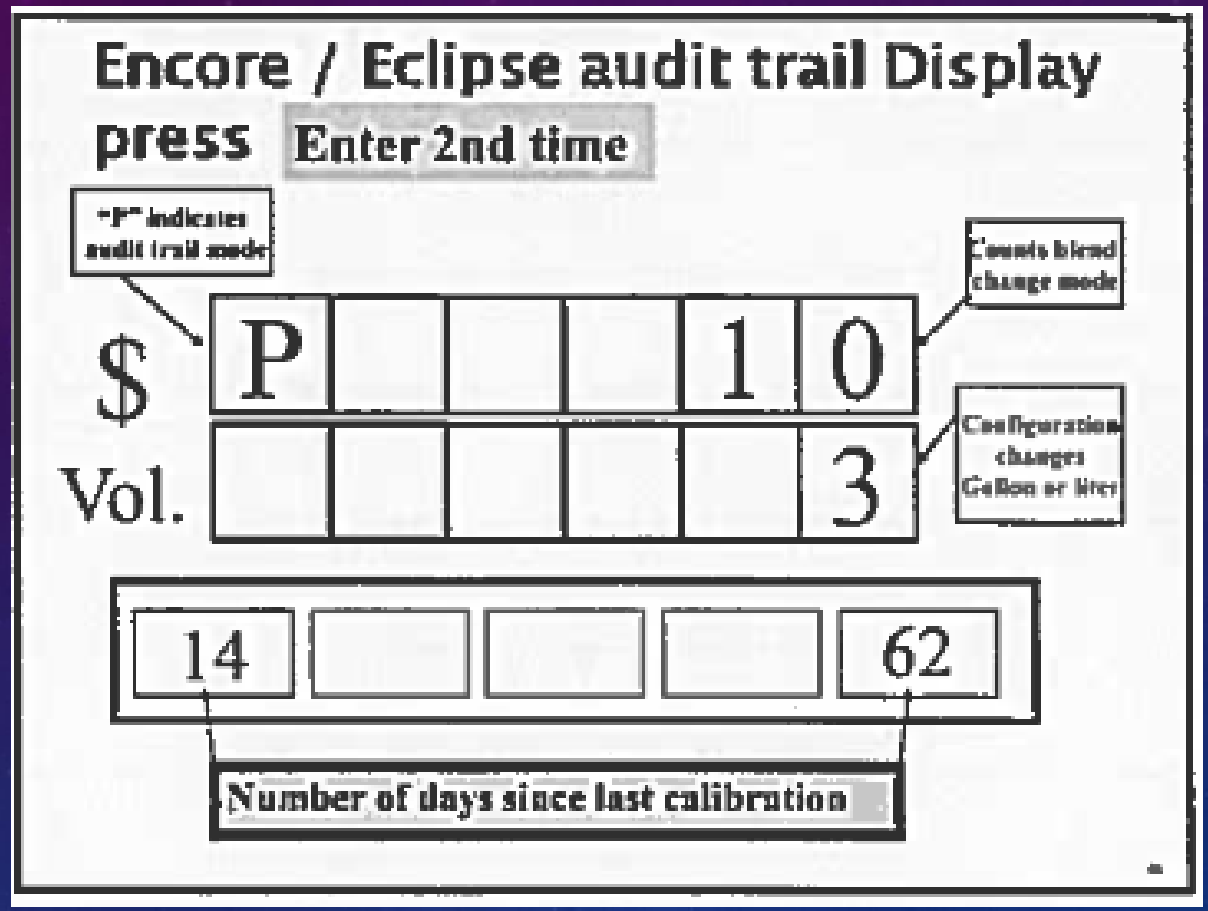
Encore / Eclipse – Normal Display

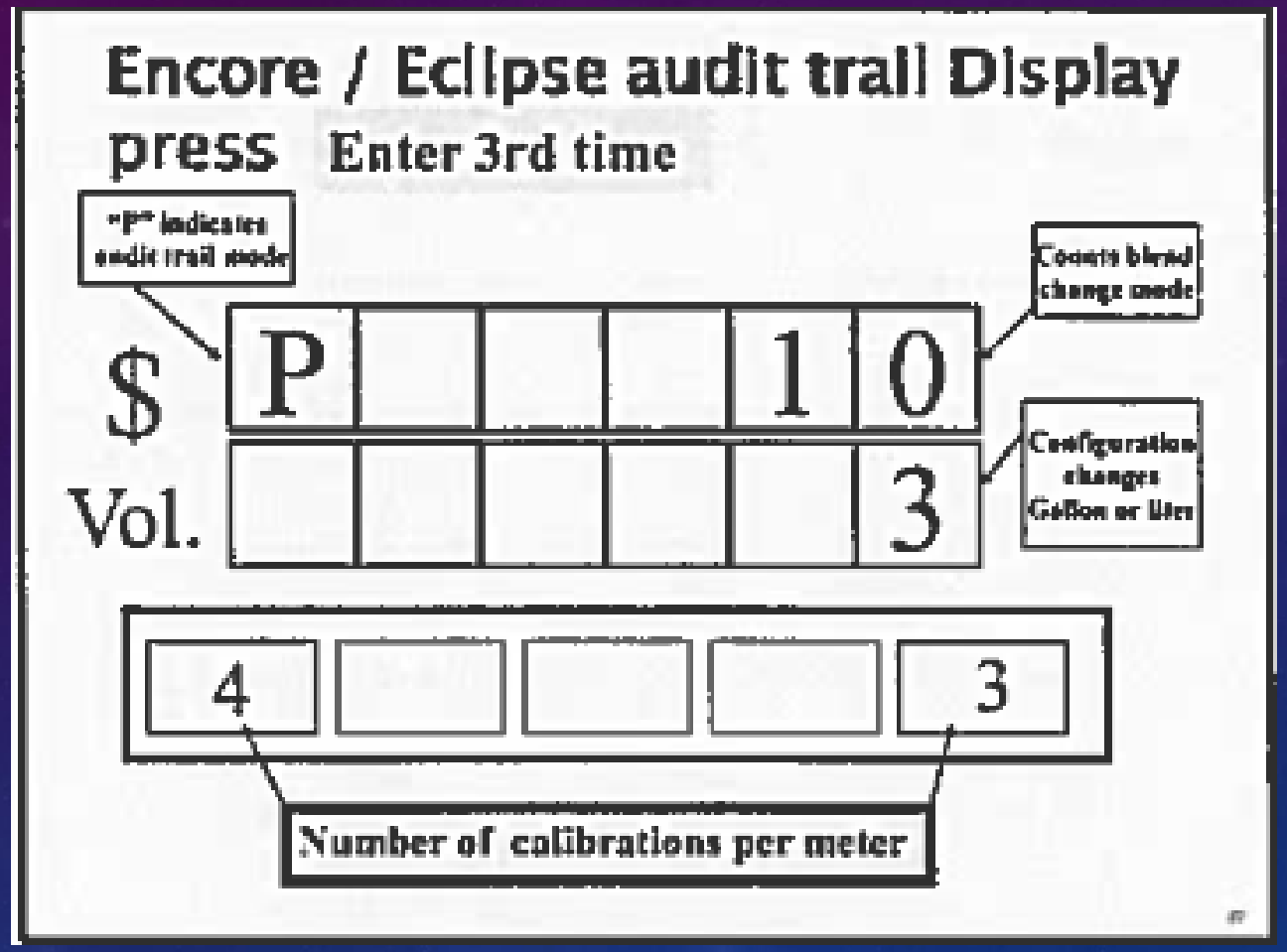
$			2	4	.5	2
Vol.		1	5	.7	6	5

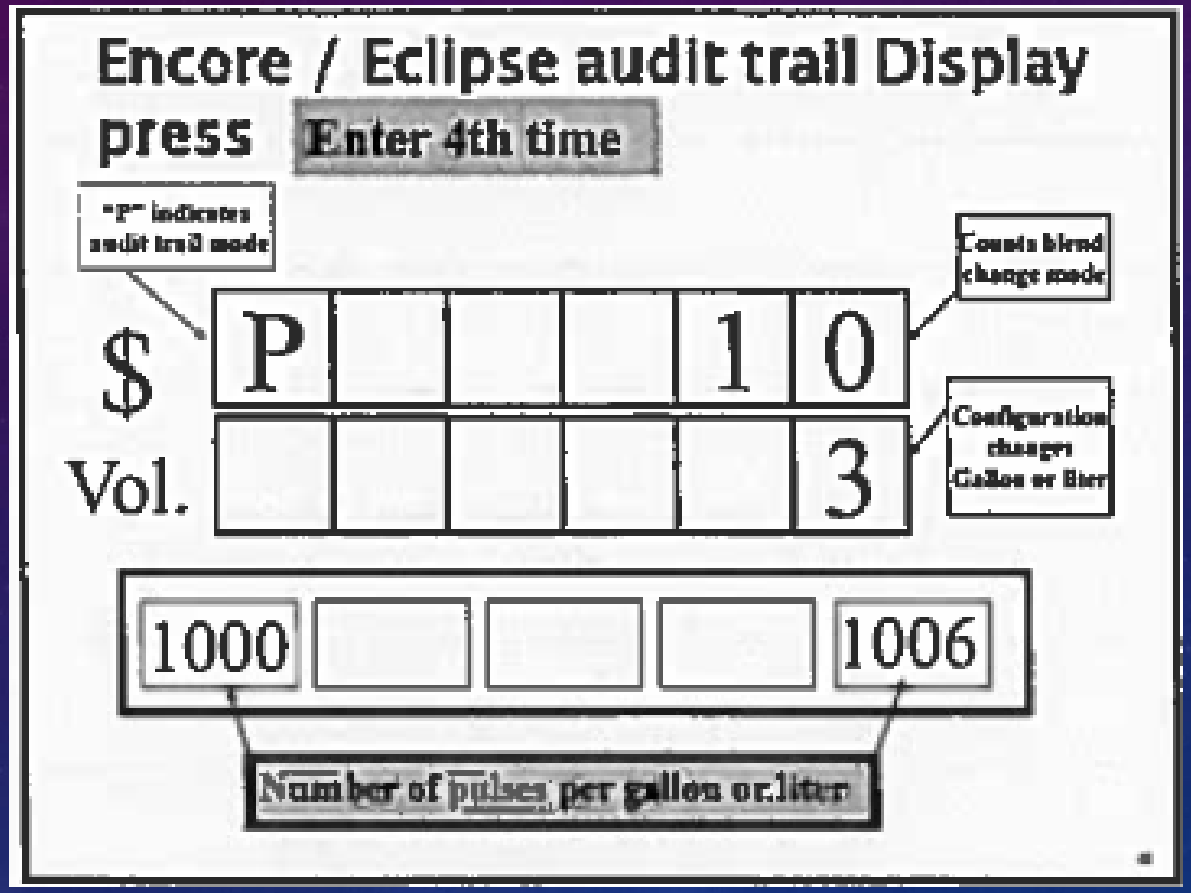
1.111	1.222	1.333	1.444	1.555

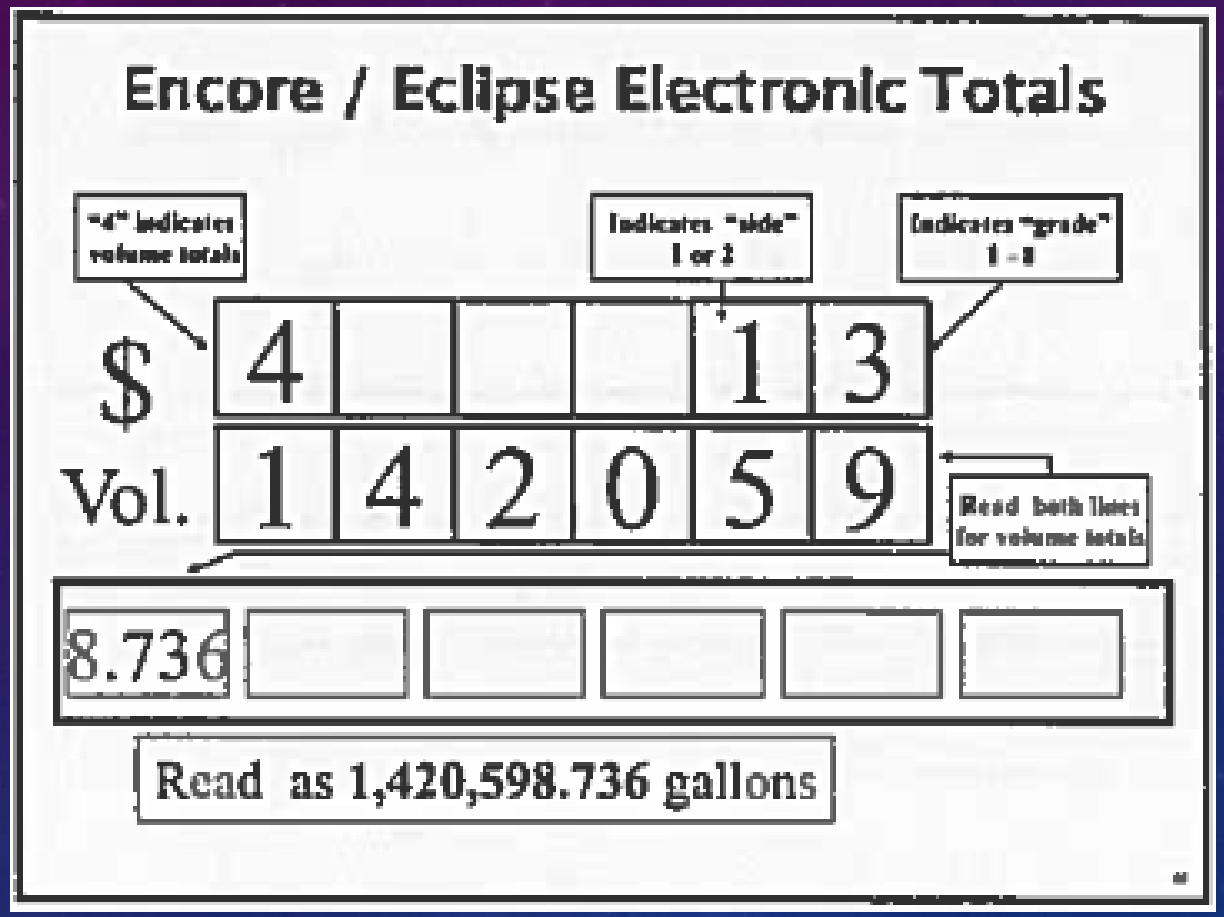
PPU $


Encore / Eclipse audit trail Display
press
Enter 1st time
"P" indicates audit trail mode
Counts blend change mode
Configuration changes Gallon or liter
$
P
1
0
Vol.
3
100
75
50
25
0
% low gr tale


Encore / Eclipse audit trail Display
press Enter 2nd time
"P" indicates audit trail mode
Counts blend change mode
$
P
1
0
Vol.
3
Configuration changes Gallon or liter
14
62
Number of days since last calibration


Encore / Eclipse audit trail Display
press Enter 3rd time
"P" indicates audit trail mode
Counts blend change mode
$
P
1
0
Vol.
3
Configuration changes Gallon or Liter
4
3
Number of calibrations per meter


Encore / Eclipse audit trail Display
press
Enter 4th time
"P" indicates audit trail mode
Counts blend change mode
Configuration changes Gallon or liter
$
P
1
0
Vol.
3
1000
1006
Number of pulses per gallon or liter

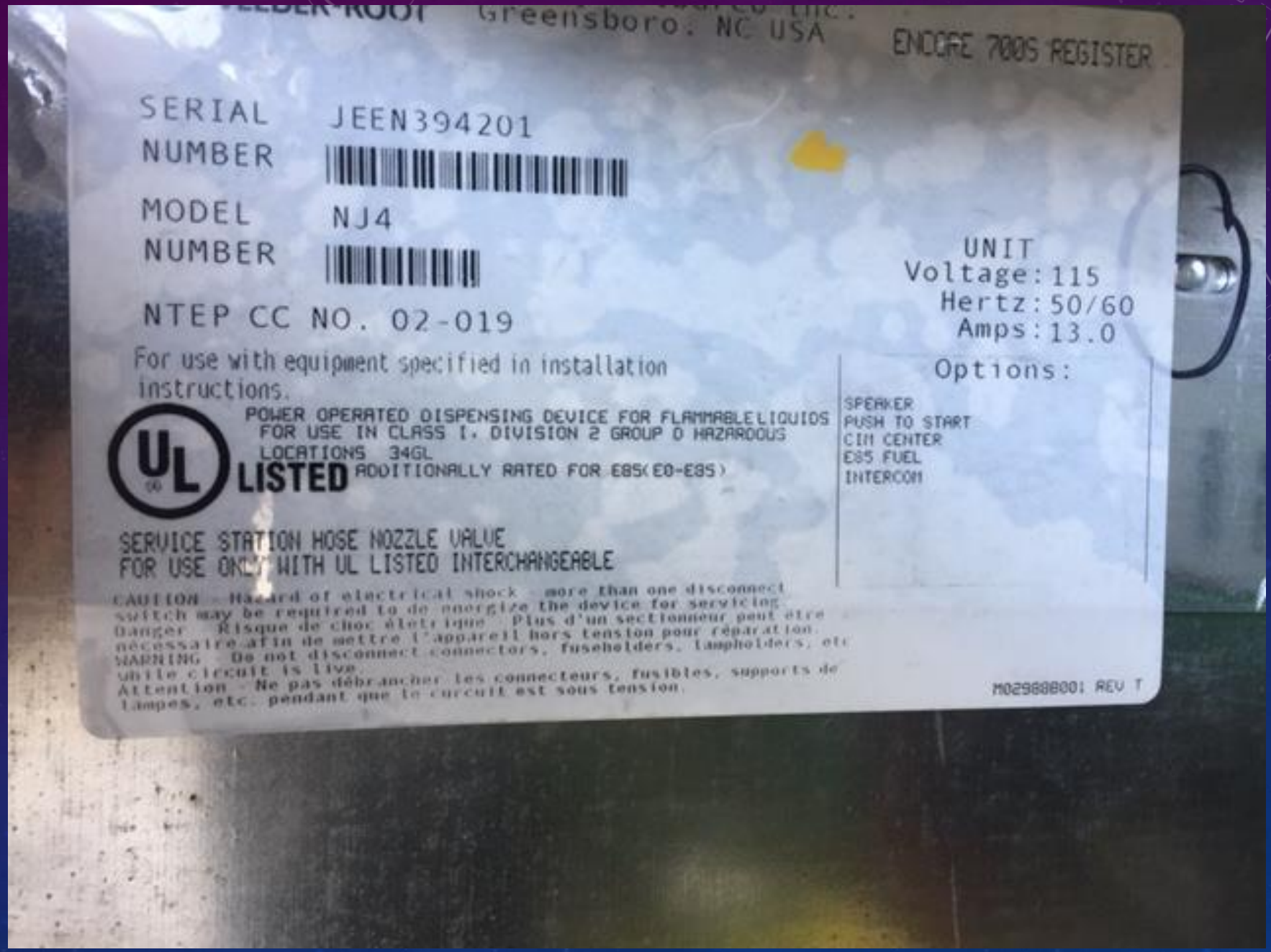

Encore / Eclipse Electronic Totals
"4" indicates volume totals
Indicates "side" 1 or 2
Indicates "grade" 1 - 8
$
4 1 3
Vol.
1 4 2 0 5 9
Read both lines for volume totals
8.736
Read as 1,420,598.736 gallons

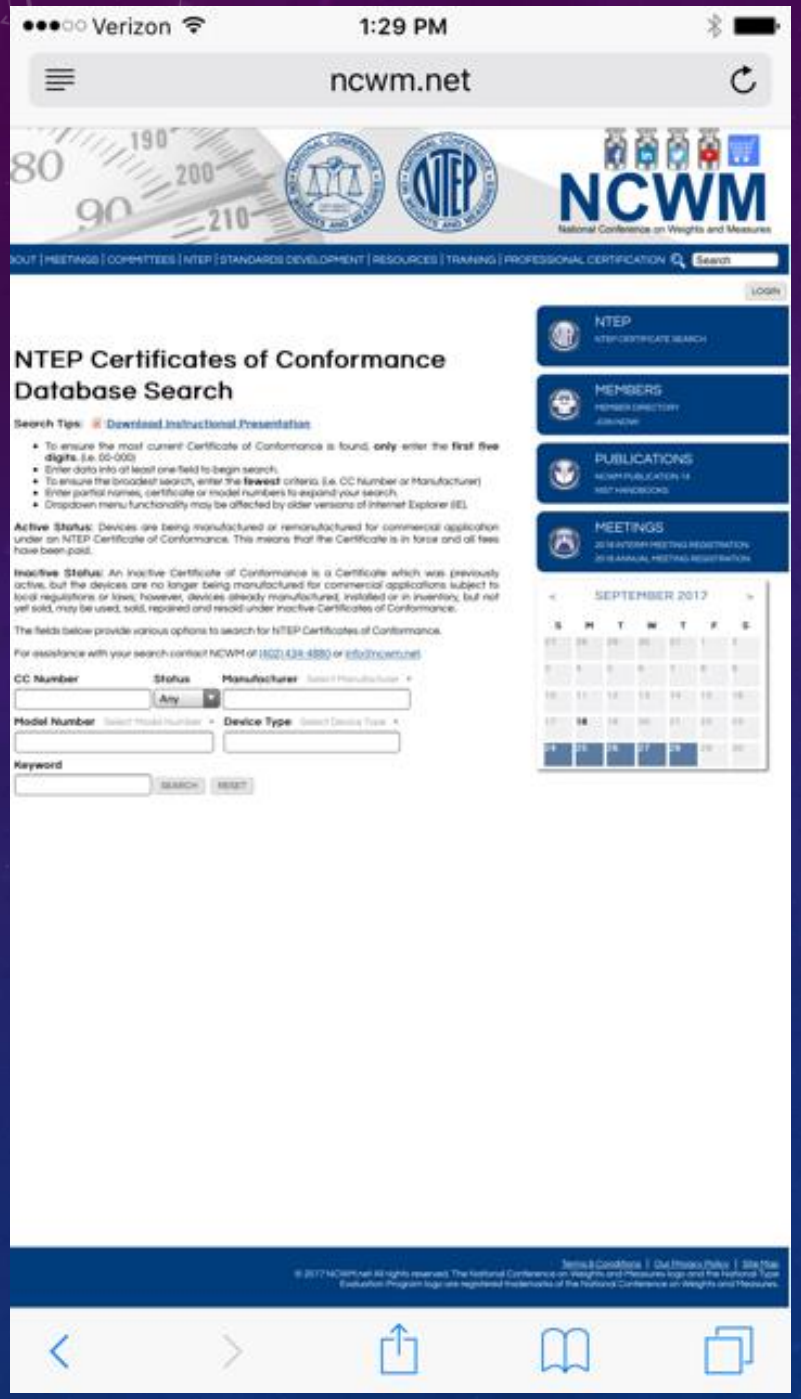
AN INSPECTOR'S MOST POWERFUL TOOL


U.S.
RELAY
MAIL
1


DIESEL
ATTENTION
If pump runs very slowly
RELEASE NOZZLE TRIGGER
COUNT TO 20
AND TRY AGAIN
UNDYED DIESEL FUEL
TAXABLE FUEL
DYED DIESEL


GALLONS
00996
LIQUID
CONTROLS


Greensboro, NC USA
ENCORE 700S REGISTER
SERIAL NUMBER JEEN394201
MODEL NUMBER NJ4
NTEP CC NO. 02-019
UNIT
Voltage: 115
Hertz: 50/60
Amps: 13.0
For use with equipment specified in installation instructions.
POWER OPERATED DISPENSING DEVICE FOR FLAMMABLE LIQUIDS FOR USE IN CLASS I, DIVISION 2 GROUP D HAZARDOUS LOCATIONS 34GL
UL LISTED
ADDITIONALLY RATED FOR E85(E0-E85)
Options:
SPEAKER
PUSH TO START
CIM CENTER
E85 FUEL
INTERCOM
SERVICE STATION HOSE NOZZLE VALVE
FOR USE ONLY WITH UL LISTED INTERCHANGEABLE
CAUTION - Hazard of electrical shock - more than one disconnect switch may be required to de-energize the device for servicing
Danger - Risque de choc électrique - Plus d'un sectionneur peut être nécessaire afin de mettre l'appareil hors tension pour réparation.
WARNING - Do not disconnect connectors, fuseholders, lampholders, etc while circuit is live.
Attention - Ne pas débrancher les connecteurs, fusibles, supports de lampes, etc. pendant que le circuit est sous tension.
M02988B001 REV T


Verizon
1:29 PM
ncwm.net
NCWM
National Conference on Weights and Measures
ABOUT | MEETINGS | COMMITTEES | NTEP | STANDARDS DEVELOPMENT | RESOURCES | TRAINING | PROFESSIONAL CERTIFICATION
Search
LOGIN
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PUBLICATIONS
MEETINGS
NTEP Certificates of Conformance Database Search
Search Tips:
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To ensure the most current Certificate of Conformance is found, only enter the first five digits. (i.e. 00-000)
Enter data into at least one field to begin search.
To ensure the broadest search, enter the fewest criteria. (i.e. CC Number or Manufacturer)
Enter partial names, certificate or model numbers to expand your search.
Dropdown menu functionality may be affected by older versions of Internet Explorer (IE).
Active Status: Devices are being manufactured or remanufactured for commercial application under an NTEP Certificate of Conformance. This means that the Certificate is in force and all fees have been paid.
Inactive Status: An inactive Certificate of Conformance is a Certificate which was previously active, but the devices are no longer being manufactured for commercial applications subject to local regulations or laws; however, devices already manufactured, installed or in inventory, but not yet sold, may be used, sold, repaired and resold under inactive Certificates of Conformance.
The fields below provide various options to search for NTEP Certificates of Conformance.
For assistance with your search contact NCWM at (301) 434-4880 or info@ncwm.net
CC Number
Status
Any
Manufacturer
Model Number
Device Type
Keyword
SEARCH
RESET
SEPTEMBER 2017
S M T W T F S
Terms & Conditions | Our Privacy Policy | Site Map

Database Search

Search Tips: Download Instructional Presentation

- To ensure the most current Certificate of Conformance is found, **only** enter the **first five digits**. (i.e. 00-000)
- Enter data into at least one field to begin search.
- To ensure the broadest search, enter the **fewest** criteria. (i.e. CC Number or Manufacturer)
- Enter partial names, certificate or model numbers to expand your search.
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The fields below provide various options to search for NTEP Certificates of Conformance.

For assistance with your search contact NCWM at (402) 434-4880 or info@ncwm.net.

CC Number 02-136

Status Any

Manufacturer Select Manufacturer

Model Number Select Model Number

Device Type Select Device Type

Keyword

SEARCH RESET PRINT

Company	Model	Device Type	Application	Certificate Number	Status	Status Date	Download CC
Wayne Fueling Systems, LLC	Ovation	Retail Motor Fuel Dispenser	Digital Electronic Computing	02-136A17	Active	04/03/2017	02-136A17.pdf

NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance

for Weighing and Measuring Devices

For:
Retail Motor Fuel Dispenser (RMFD)
Digital Electronic Computing
Model: 123/ABCDEF/XX/YY (See page two)
Generic Name: Ovation
Max. Capacity: $9999.00 Total Sale
999.000 Total Volume
$9.999 Total Unit Price

Submitted By:
Wayne Fueling Systems, LLC
3814 Jarrett Way
Austin, TX 78728
Tel: 215-257-2759
Fax: 512-388-8456
Contact: Randy Moses
Email: Randy.Moses@wayne.com
Web site: www.wayne.com

Standard Features and Options

- 1 to 3 Grades Unblended Product Capability
- 2 to 5 Grades Blended Product Capability
- iGEM and iGEM2 Upper Electronics with Built-for-Purpose Software iGEM2 Version No. 13.002 or Higher
- Metric Capability
- Capacities Display Back-up
- Computing Capability
- Preset Capability for Price
- Remote or Dispenser Controlled with Pre-pay/Post-pay/Pay-at-Pump with Post-Delivery Discount Capability
- Backlight Sales Display and Electronic Totalizer
- Category 1 Physical Seal for Calibration Parameters
- Category 2 Event Counter for Blending and "Gallons to Live" Configuration Parameters

Options:

- Electro-Mechanical Totalizer
- Vapor Recovery Assist or Balance
- Wayne Trac Point-of-Sale (POS) Capability
- Premium Injection Diesel Option (Category 1 Physical Seal)
- Additech Injection System (Category 2 Event Counter) CC Number 00-100A4
- Cash Acceptor, Credit Card Processing – with or without Bar Code Scanner (Wayne Scan)
- In Dispenser Point-of-Sale (ID POS) System Software Version 1.50 (or Higher)
- 10.4" VGA Display with Soft Keys and 5.7" QVGA Display with or without Soft Keys
- Attended or Unattended Sites

Note: Meter options are at the end of the "Identification" section on page three.

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of "NIST Handbook 44 Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Kristin Malfey
Chairman, NCWM, Inc.

Jerry Buendel
Committee Chair, National Type Evaluation Program Committee
Issued: April 3, 2017

1135 M Street, Suite 110 / Lincoln, Nebraska 68508

Wayne Fueling Systems, LLC
Retail Motor Fuel Dispenser / 123/ABCDEF/XX/YY (Generic Name: Ovation)

Application: For use in dispensing gasoline, E-85, diesel motor fuels, or Diesel Exhaust Fluid (DEF). Additionally, the meters can blend diesel and biodiesel (up to B100 (up to 100% biodiesel)) and gasoline and ethanol (up to E-100 (up to 100% ethanol)) at attended or

Wayne Fueling Systems, LLC
Retail Motor Fuel Dispenser / 123/ABCDEF/XX/YY (Generic Name: Ovation)

Sealing: The Ovation dispenser uses a Category 1 physical seal for the meter calibration and a Category 2 method of sealing event counter for configuration of gallons to liters and blend ratios settings. The basic Ovation Series dispenser uses the iMeter AKA Global Hydraulics Module (GHM) positive displacement duplex meter system or the Wayne Model XFlo positive displacement fuel meter.

The optional Liquid Controls Model M5 measuring element can be sealed with a wire security seal as described on NTEP CC Number 92-021A2. The Wayne optical pulser is wire sealable to the measuring element to prevent tampering. The calibration switches used for the Wayne optical pulsar are located in the dispenser head and provisions are provided to seal a cover to prevent access.

The Wayne Integrated Pulsers (WIP) uses a physical seal for the meter calibration window. Access to the calibration window is prevented by a metal pin, which is inserted and secured to a metal clamp. A wire security seal is attached through a hole in the pin. Each calibration window is sealed separately. The iMeter, iMeter2, and XFlo meters can also be sealed by a wire security seal wrapped around the calibration window of the pulser and upper part of the meter.

Category 2 Event Counter for Dispenser Indications: The dispenser also uses the iGEM electronics for information on sealing, audit trails, and blends. Gallon to liter conversions and blend settings (if applicable) configuration parameters are entered by using a handheld remote. An audit trail in the form of an event counter and a display is provided by using the handheld remote. The event counters increments once each time when one or more configuration parameters are changed. By entering the "Weights and Measures" mode, the audit trail metering unit and blend ratio change event counter may be viewed.

To enter the "Weights and Measures" mode and review the Category 2 weights and measures event counter for blending dispensers, follow the steps below:

1. Press "ENTER" and then press "CLEAR" twice to access the "Weights and Measures" mode. The sale display will show bLEnd rAtioS and the current blend ratios for all the blended products. **Note:** If another button is not pressed within 20 seconds, the computer will toggle through the values without interaction from the remote.
2. Press "NEXT" repeatedly to view the following:
   a. Blend ratio change counters
   b. Display legend, measuring units:
      - LItErs – Litres
      - US GAL – U.S. Gallons
      - IP GAL – Imperial Gallons
   c. Volume metering unit change counter
3. To exit the "Weights and Measures" mode, repeatedly press "NEXT" until it exits.

To review the weights and measures event counter in the "Weights and Measures" mode for non-blending dispensers, follow the steps below:

1. Press "CLEAR."
2. Read sales money display for "n" where "n" is the unit change event counter. The volume display will show the applicable unit.
3. Press "CLEAR" and then press "ENTER" three to four times to exit the "Weights and Measures" mode.

The optional Additech injection system has a separate Category 2 method of sealing for configuration and calibration adjustments with two event counters; one counter for configuration and the second counter for calibration parameters. A test verification kit is provided by Additech (800-243-2941) to any jurisdiction that has a fuel additive system in their area.

To view the Category 2 event counter for the Additech injection option, follow the steps below:

1. Remove the bottom panel of the fuel dispenser using the key provided in the kit. (See Photo 1)
2. Access the calibration box interface connection by opening the explosion-proof calibration pipe on the left side of the dispenser. (See Photo 2)
3. Remove the calibration box from the test kit and plug it into the calibration interface. Test kit must be provided to any inspector who wants to review the event counters. This will power the calibration box and provide access to event counters and an interface for performing test transactions.
4. On the calibration box display, select "W&M Functions" from the main menu. W&M submenu will allow access to view event counters or to perform a test transaction. (See Photo 3)

Wayne Fueling Systems, LLC
Retail Motor Fuel Dispenser / 123/ABCDEF/XX/YY (Generic Name: Ovation)

5. Use menu option 1 "Event Counters," to access the counters submenu. Select either the "Calibration Count" (1) to display any changes in the pulse count per selected volume or the "Configuration Counter" (2) to display any changes in the product sizes

1. Remove the bottom panel of the fuel dispenser using the key provided in the kit. (See Photo 1)
2. Access the calibration box interface connection by opening the explosion-proof calibration pipe on the left side of the dispenser. (See Photo 2)
3. Remove the calibration box from the test kit and plug it into the calibration interface. Test kit must be provided to any inspector who wants to review the event counters. This will power the calibration box and provide access to event counters and an interface for performing test transactions.
4. On the calibration box display, select "W&M Functions" from the main menu. W&M submenu will allow access to view event counters or to perform a test transaction. (See Photo 3)

Wayne Fueling Systems, LLC
Retail Motor Fuel Dispenser / 123/ABCDEF/XX/YY (Generic Name: Ovation)

5. Use menu option 1 "Event Counters," to access the counters submenu. Select either the "Calibration Count" (1) to display any changes in the pulse count per selected volume or the "Configuration Counter" (2) to display any changes in the product sizes delivered. (See Photos 4 and 5)
6. When review of the event counter is completed, push "9" on the calibration box until you return to the main screen. Unplug the calibration box from the calibration interface and replace the cap on the calibration interface pipe. Replace the door panel on the dispenser and put everything back into the test kit.

The premium diesel injection system option has a Category 1 physical sealing provision. The calibration mechanism is on the meter inside the column cover. In order to remove the cover, two drilled head bolts are located under the vapor barrier platform. A wire security seal can be threaded through the two drilled head bolts, which prevents access to the calibration mechanism. (See Photo 6)

Operation: Field test procedures for the Additech System:

To verify the calibration for the additive dispensing option, follow the steps below:

1. Remove the bottom panel of the fuel dispenser using the key provided in the kit. (See Photo 1)
2. Access the calibration interface by opening the explosion proof calibration pipe on the left side of the dispenser. (See Photo 2)
3. Remove the calibration box from the test kit and plug it into the calibration interface. Test kit must be provided to any inspector who wants to verify the calibration. (See Photo 7)
4. Remove the check valve and testing tube from the test kit and connect it to the calibration port at the top of the opening. An adjustable wrench is included to tighten this fitting. Teflon tape may be used if needed on the threads to obtain a tight connection with no leaks. (See Photo 8)
5. On the calibration box display, select "W&M Functions" from the main menu. W&M submenu will allow access to view event counters or to perform a test transaction. (See Photo 3)
6. On the calibration box, select (2) to perform a test transaction. (See Photo 9)
7. The default size of 4 ounce will display. Select (1) if you want to change the size of the delivery otherwise, open the yellow ball valve handle (handle points out from the dispenser in open position – See Photo 2) and press (2) to test a 4 oz delivery. The first delivery will not be measured. It is used to fill the check valve with fluid and wet the flask. Be sure that the additive has drained completely from the testing tube. The successful delivery screen will be shown on the calibration box with the configured number of pulses + 1. (See Photo 10)
8. The additive collected can be returned to the storage container via the fill door. (See Photo 11)
9. After the initial "wetting" delivery, select (9). Exit from the menu to go back to the "Test Transaction" main menu. Select (2) again to perform a test transaction. Again, be sure all additive has drained from the testing tube.
10. Complete a second delivery and read the bottom of the meniscus on the flask. The graduations on the flask are in .25% increments. Apply the maintenance or acceptance tolerance for < 1 gpm flow rate.
11. Return the additive collected to the storage container via the fill door.

When testing is complete, close the ball valve using the yellow handle and remove the check valve. Then push (9) on the calibration box until you return to the main screen and unplug the calibration box from the calibration interface and replace the cap on the calibration interface pipe. Replace the door panel on the dispenser and put everything back into the test kit.

Test Conditions: This certificate supersedes Certificate of Conformance (CC) Number 02-136A16 and is issued to add the position 1 type parameter in the model number to recognize the HW and HL models. The HW is a High-Speed and DEF arrangement using the same LC meter and iMeter but without the heating for the DEF. It is only for warm climates where the temperature does not drop below 12F. Metrologically speaking, there is nothing different with this unit as compared to the HD models. The cabinet is simply a not heated a DEF cabinet. The HL is the same as the HD and HW models (combination of LC meter and iMeter), except the iMeter handles normal petroleum products instead of DEF. It is for high-speed diesel and standard speed diesel through the same dispenser. Again, metrologically, there is no difference between this model and the HD or HW models as the meter and electronics do not know what product is running through the meter. No additional testing was deemed necessary. Pictures were also added showing the seal on the LC M5 Pulser and the Calibration Switch Board for the LC M5 meter. Previous test conditions are listed below for reference.

Certificate of Conformance Number 02-136A16: This certificate superseded CC Number 02-136A15 and was issued to clearly recognize the device was approved for E-100 and E-100 ethanol blending. Previous test conditions and documents were reviewed by the NTEP administration and the evaluating NTEP laboratory. No additional testing was deemed necessary. Previous test conditions are listed below for reference.

Wayne Fueling Systems, LLC
Retail Motor Fuel Dispenser / 123/ABCDEF/XX/YY (Generic Name: Ovation)

Information Reviewed By: J S. Paterny, L. Bernetich (NCWM) 02-136, 02-136A1, 02-136A2, 02-136A3, 02-136A4, 02-136A5, J. Truex (NCWM) 02-136A6, 02-136A7, 02-136A8, 02-136A9, 02-136A10, 02-136A11, 02-136A12, 02-136A13, 02-136A14, 02-136A15, 02-136A16, 02-136A17

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Examples of Device:

Xflo

iMeter

Handheld Remote

Wayne Fueling Systems, LLC

AUDIT TRAILS:
LEARNING TO INTERPRET AND APPLY INFORMATION

- What is the device telling us?
- Making Jurisdictional policies


Sale $
Gallons
bLEnd
PRE-PAY INSIDE
Diesel
Unleaded
Blend
Blend
Premium
0
67
33
100
Diesel
85
87
89
91
PUSH HERE


Sale $
Gallons
CASH CUSTOMERS PLEASE
PRE-PAY INSIDE
OR USE CREDIT CARD AT THE PUMP
PUMP OFFLINE
Unleaded
Blend
Blend
Premium
0
33
67
100
85
87
89
91
PUSH HERE


Please Pay First
Regular
Regular
Plus
Plus
Premium
$ 3.019
PUSH TO START
PUSH TO START
PUSH TO START
PUSH TO START
PUSH TO START
MINIMUM OCTANE RATING
87
PRESS
88
PRESS
89
PRESS
90
PRESS
91
PRESS
1 Select Payment At Display
2 Remove Nozzle
3 Push Yellow Grade Button
4 Return Nozzle

EXAMPLE - Event Log – Pump 1, Meter 1

Event Counter	Date	Time	Parameter	
1	7/3/08, Thurs	5:10 p.m.	Meter	
2	7/7/08, Mon	5:00 a.m.	Meter	
3	8/8/08, Fri	5:15 p.m.	Meter Ca	
4	8/11/08, M		Calibrat	
5				
6				Pulses/gal
7				Pulses/gal
8	12/24/08, Wed	5:15 p.m.		ulses/gal
9	12/29/08, Mon	5:35 a.m.		
10				ons
11				992 Pulses/gal
12	1			1044 Pulses/gal
13	12/12/08		Meter Calibration	989 Pulses/gal
14	12/15/08,	5:30 a.m.	Meter Calibration	1041 Pulses/gal
15	12/24/08, Wed	5:15 p.m.	Meter Calibration	994 Pulses/gal
16	12/29/08, Mon	5:35 a.m.	Meter Calibration	1040 Pulses/gal
17	12/31/08, Wed	5:05 p.m.	Meter Calibration	999 Pulses/gal
18	1/5/09, Mon	6:00 a.m.	Meter Calibration	1043 Pulses/gal
19	1/9/09, Fri	5:44 p.m.	Meter Calibration	993 Pulses/gal
20	1/12/09, Mon	5:53 a.m.	Meter Calibration	1040 Pulses/gal

Meter Calibration	994 Pulses/gal
Meter Calibration	1040 Pulses/gal

y

nd

weekend

Labor Day

Thanksgiving

weekend

Christmas

New Years

weekend

RISK BASED R.M.F.D. INSPECTIONS

Time well spent?

OTHER RESOURCES ON AUDIT TRAILS

- NIST Special Publication 1010, June 2004
  - Developed by Juana Williams, NIST WMD
  - Interactive, self-study CD ROM
  - Audit Trail Criteria
  - Interactive example
  - CD ROM and study guide
- For information about CD ROM, contact:
  - Juana Williams, NIST WMD
    - Tel: (301) 975-3989
    - Email: juana.Williams@nist.gov

Scott Wagner, Petroleum Inspector

Colorado Dept. of Labor and Employment

Division of Oil and Public Safety

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