National Conference on Weights and Measures
National Type Evaluation Program

Electronic Cash Register Interfaced with Retail Motor Fuel Dispensers

Technical Policy • Checklists • Test Procedures

NCWM

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Amendments

Electronic Cash Register Interfaced with Retail Motor Fuel Dispensers

Section Number	Amendment	Page	Source
Document	Please note that the NTEP Measuring Devices publication has been thoroughly reviewed by NCWM staff. Changes have been made, but none are to change intent of the policies, checklists or test procedures, thus considered editorial. Issues or concerns should be brought to the attention of NCWM staff.	Document	Editorial

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Checklists and Test Procedures

National Type Evaluation Program
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Checklists and Test Procedures

Introduction

This checklist is intended for use when conducting general evaluations of new electronic cash registers (ECR) that are to interface with retail motor fuel dispensers. It is assumed that the dispenser was previously evaluated, if not, the Liquid Measuring Device checklist must be applied to the dispenser sale system. The ECR must interface with a dispenser to perform this evaluation. Specific criteria that apply to service station control consoles are in the checklist for retail motor fuel dispensers and must be applied if the cash register also serves as the service station controller. As a minimum, two dispensers from different manufacturers, each of which includes all of the features to be listed on the ECR Certificate of Conformance (CC), must be evaluated with the ECR in order to have the statement "equivalent and compatible equipment" appear on the CC.

This checklist is designed in a logical sequence for the user to determine and record the conformance of the device with the elements of *NIST Handbook 44*. The user should make copies of the checklist to serve as worksheets and preserve the original for reference. In most cases, the results of evaluation for each element can be recorded by checking the appropriate response. In some cases, the user is required to record values, results, or comments. In those cases, space is provided.

1.   Identification

Code Reference: G-S.1. General
Each cash register must comply with the appropriate *NIST Handbook 44* identification requirements.

All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect, shall be clearly and permanently marked for the purposes of identification with the following information (prefix lettering may be initial capitals, all capitals, or all lower case.)

Location of the information:

_____

_____

1.1.	The name, initials, or trademark of the manufacturer or distributor.	☐ Yes ☐ No ☐ N/A
1.2.	A model identifier that positively identifies the pattern or design of the device. The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.) The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lower case.	☐ Yes ☐ No ☐ N/A
1.3.	Except for equipment with no moving or electronic component parts and not built for purpose, software-based devices, a non-repetitive serial number. The serial number shall be prefaced by the words "Serial Number" or an abbreviation, or a symbol, that clearly identifies the number as the required serial number. Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No, and S No.)	☐ Yes ☐ No ☐ N/A
1.4.	For not built-for-purpose, software based devices the current software version designation. The version or revision identifier shall be prefaced by the word "Version" or "Revision" as appropriate and either word may be followed by the word "Number." The abbreviations for the word "Version" shall, as a minimum, begin with the letter "V." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R." The abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.)	☐ Yes ☐ No ☐ N/A

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Code Reference: G-S.1. (e)

1.5.   An NTEP Certificate of Conformance (CC) Number or a corresponding CC addendum number for devices that have (or will have) a CC. The number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the word "Number" or an abbreviation for the word "Number." The abbreviation for the word "Number" shall as a minimum begin with the letter "N" (e.g., No or No.)   ☐ Yes ☐ No ☐ N/A

The device must have an area, either on the identification plate or on the device itself, suitable for the application of the Certificate of Conformance Number. If the area for the CC number is not part of an identification plate, then note its intended location below and how it will be applied.

    1.5.1.   Location of CC Number if not located with the identification information:

    _____

    _____

1.6.   The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.   ☐ Yes ☐ No ☐ N/A

1.7.   The device must be marked with a unique serial number to identify the electronic element that controls the system. A remote display is not required to have a serial number because it usually does not have any electronics to analyze the signal received from the measuring element. Similarly, other elements of a system, (e.g., a printer, keyboard, cash drawer etc.) which cannot be operated as stand-alone units or are not intended to interface in a system of other models are not required to have a serial number.   ☐ Yes ☐ No ☐ N/A

1.8.   The marking must be visible after installation.   ☐ Yes ☐ No ☐ N/A

1.9.   Equipment is to be marked on a surface that is an integral part of the chassis, which is visible after installation. If the required information is located on the back of the device, the same information must also appear on the side, front, or top. It may be installed on the housing only if the housing can be fitted with a security seal. The bottom of a device is not an acceptable surface.   ☐ Yes ☐ No ☐ N/A

1.10.   The marking must be permanent. It may be a metal or plastic plate attached with pop rivets, adhesive, or other means. Removable bolts or screws are not permitted. A foil plate may be used provided it is destroyed in any attempt to remove it. Additionally, the printing on a foil plate must be easily read and not easily obliterated by rubbing with a relatively soft object (e.g., the wood of a pencil.)   ☐ Yes ☐ No ☐ N/A

Note: A location under a cover or inside a panel door is acceptable. Visibility may be achieved by placing a duplicate serial number badge on the front, side, or top of the ECR. This badge may contain only the serial number if the other information is visible elsewhere on the ECR.

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Code Reference: G-S.1.1. Location of Marking Information for Not Built-for-Purpose, Software-Based Devices

1.11. For not built-for-purpose, software-based devices, the following shall apply:

    1.11.1. The required information in G-S.1 Identification. (a), (b), (d), and (e) shall be permanently marked or continuously displayed on the device. **OR** ☐ Yes ☐ No ☐ N/A

    1.11.2. The Certificate of Conformance (CC) Number shall be:

        1.11.2.1. Permanently marked on the device. OR ☐ Yes ☐ No ☐ N/A

        1.11.2.2. Continuously displayed. OR ☐ Yes ☐ No ☐ N/A

        1.11.2.3. Accessible through an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to "Help," "System Identification," "G S.1. Identification," or "Weights and Measures Identification." ☐ Yes ☐ No ☐ N/A

Note: For (1.11.2.), clear instructions for accessing the information required in G-S.1. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.

2. Indicating and Recording Elements

Code Reference: G-S.5.1. Price Look-up Codes (PLUs)

2.1. PLUs must operate only with appropriate information, (e.g., if a PLU activates a dispenser transaction, a volume input is required before a price is computed and recorded.) ☐ Yes ☐ No ☐ N/A

2.2. Other PLUs must not interact with dispenser information. ☐ Yes ☐ No ☐ N/A

2.3. Manual volume entries are permitted. They must be clearly identified on the receipt as a manual entry by the terms "Manual Fuel Sale." ☐ Yes ☐ No ☐ N/A

Note: All uppercase or a combination of upper and lower case letters are permitted provided the evaluating laboratory finds the resulting text to be clear and legible.

2.4. Incorrect entries shall be signaled by an audio and/or visual signal. ☐ Yes ☐ No ☐ N/A

2.5. A dispenser verification display (e.g., segment test) shall not be recorded by the ECR. ☐ Yes ☐ No ☐ N/A
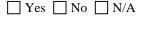
Code Reference: S.1.6.2. Provision for Power Loss

2.6. Power Interruptions. First test with a power failure to the ECR alone. Then a power failure to the dispenser alone. Finally, a power failure to both components simultaneously. When power interruption occurs, the register must do one of the following:

    2.6.1. Continue to function and perform correctly either automatically or manually. ☐ Yes ☐ No ☐ N/A

    2.6.2. The transaction is halted and can be continued when power returns. ☐ Yes ☐ No ☐ N/A

Note: The ECR may continue to function while power is interrupted, (e.g., the ECR is equipped with an uninterruptible power supply.) Alternatively, the ECR may cease operation when power is interrupted and may resume the transaction in process at the time of the power failure when power is returned. Either alternative is acceptable provided that the ECR continues to function and perform correctly. There are no requirements to indicate when a power failure or interruption has occurred.

2.7.   Provisions for Power Loss.

Note: For remote controllers, (e.g., cash register, console, etc.) which have the capability to retain information pertaining to a transaction, (e.g., stacked completed sales, if the information cannot be recalled at the dispenser following a power outage, (e.g., uninterruptible power supply or other means) then provisions must be made for the transaction information to be recalled and verified for at least 15 minutes following a power outage.

2.7.1.   Remote controllers which stack completed sales must have a means to enable the transaction information to be recalled and verified for at least 15 minutes.   ☐ Yes ☐ No ☐ N/A

Note: The criteria for power loss to a fuel dispenser are given in the retail motor fuel dispenser checklist.

2.8.   An ECR shall be able to record all quantities, unit prices, and total prices up to the capacity of the dispenser. When the capacity of the quantity or total price is exceeded and the display "rolls over," the ECR shall not record the "rolled over" value but shall either record the correct total volume and total price or give an error indication.   ☐ Yes ☐ No ☐ N/A

2.9.   A cash register shall not print the values from a dispenser until the delivery has been completed and dispenser turned off.   ☐ Yes ☐ No ☐ N/A

Items not measured or weighed may be split-priced according to general marketing practices. Acceptable price extensions will depend on individual State policies. Normally, the single item price will be the multiple item price divided by the number of items and rounded up to the next high cent. If the single item price is different from the price that would be computed as described, the price per item must be posted at the display. *See FPLA value comparison considerations and the Model Unit Pricing Regulation.* Suggested multiple item prices for test procedures are 3/$1.00 and 7/$1.00. The single item prices may be recorded as $.34, $.34, $.32 or $.34, $.33, $.33 and $.15, $.15, $.15, $.15., $.15, $.15, $.10 or $.15, $.14, $.14, $.15, $.14, $.14, $.14, respectively.

2.10.   Price calculations for multiple-item-priced commodities shall be correctly computed as described above for:

2.10.1.   Prices entered via PLUs.   ☐ Yes ☐ No ☐ N/A

2.10.2.   Prices entered through the keyboard.   ☐ Yes ☐ No ☐ N/A

3.   Recorded Representations

Code Reference: G-S.5.1. and S.1.6.7

A sales receipt showing the quantity, unit price, total price, and product identity for each fuel delivery in a transaction is required for point-of-sale systems. A printed receipt must always be available to the customer upon request. In addition, systems may be equipped with the capability to issue an electronic receipt. The customer may be given the option to receive the receipt electronically (e.g., via cell phone, computer, etc.).
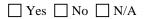
Various forms (or representations) of sales receipt formats are acceptable provided they are clear and understandable. Guidelines are provided to assist manufacturers and weights and measures officials in determining the acceptability of formats. Symbols other than those given below may be acceptable, but they will be reviewed on a case-by-case basis. More descriptive symbols and terms are acceptable.

3.1.   The unit of measure shall be clearly defined. Acceptable symbols for units are: Gallon Gal, of G for gallons and Liter, l or L for liters. Upper or lower case is optional except that a lower case "l" must not resemble a "1" (numeral one), (e.g. a script "l" is an acceptable symbol for liters.)   ☐ Yes ☐ No ☐ N/A

The unit of measure may be defined with either the quantity value, (e.g., 10 000 GAL) or with the unit price, (e.g., $1.119/Gal), not necessarily both.

3.2.   Acceptable designations of the unit price are: "@" as a prefix to the unit price value, an upper or lower case "X" or slash between the quantity and unit price, $/G, PPG (price per gallon), PPL (price per liter), UP (unit price), P/G, price/Vol, PPU (price per unit), DOL/GAL.   ☐ Yes ☐ No ☐ N/A

3.3.   The total fuel price must be clearly distinguished from other information in the fuel transaction. To identify the total fuel sale price, use one of the following methods:

   3.3.1.   Decimal point in the proper dollar position, (e.g., XX.XX.) If a dollar sign is not used, there must be at least one offset column of the least significant digit in recorded information, other than the sale price.   ☐ Yes ☐ No ☐ N/A

   3.3.2.   The words gas, diesel, or other product designation may be used with the word "SALE" (e.g., "FUEL SALE" or "GAS SALE") or the product identification followed by the sale price, (e.g., GAS 20.00.)   ☐ Yes ☐ No ☐ N/A

3.4.   Each fuel delivery in a transaction for a single customer must be recorded separately.   ☐ Yes ☐ No ☐ N/A

3.5.   Where a post-delivery discount(s) is applied, the sales receipt must provide: ☐ Yes ☐ No ☐ N/A

       - the total quantity, unit price, and total computed price that were displayed on the dispenser at the end of the delivery prior to any post-delivery discount(s);

       - an itemization of the post-delivery discounts to the unit price; and

       - the final total price of each fuel sale after all post-delivery discounts are applied.

3.5.3.6.   When a service station cash register/console is capable of recording sales transactions of other products, the fuel transaction must be clearly distinguished from the other transactions. A "product class" must be associated with the fuel transaction as well as the other transactions. In terms of format, the fuel transactions may be separated (blocked-off) from other transactions by blank lines or by at least one offset column between the sales price and the other recorded information.   ☐ Yes ☐ No ☐ N/A

3.6.3.7.   The product identity for fuel need only distinguish it from other items. The product name, code number (similar to a price look-up code), or hose or pump number are acceptable designations of product identify. *See LMD Code S.1.6.4.*   ☐ Yes ☐ No ☐ N/A

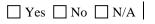| Example 1		Example 2	
Meat	3.89	Meat	3.89
Soda	2.99	Soda	2.99
Gas 5.080 G @ 1.000	5.08	Gas 4.080 G @ 1.000	4.08
Cig	1.00		

Note: NIST Handbook 44 does not require that product identification, date, and change due be printed on a ticket or a cash register receipt. These requirements apply to recorded representations resulting from a final sale, not to deposit slips for prepay transactions, etc.

3.7.3.8.   The quantity representation of an item sold by count must be expressed in whole units. An expression of count with a decimal point and trailing zeroes, (e.g., 2.00 items) is acceptable provided that fractions of a whole unit cannot be expressed.   ☐ Yes ☐ No ☐ N/A

4.   Provisions for Sealing

Code Reference: G-S.8. Provision for Sealing Electronic Adjustable Components
Remote controllers, which have the capabilities to electronically adjust components that affect the performance of a device, shall have provisions for approved means of security. *See LMD - Appendix A - Philosophy for Sealing, Typical Features to be Sealed.*