

VMC Soda Retrofit Kits: Configuration and Usage Instructions

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1 Introduction

The VMC Retrofit Kit adds a number of state-of-the-art features to your vending machine:

- Two line by sixteen character display
- User-friendly Service Mode for setup and maintenance tasks
- Support for MDB coin mechs, bill validators, and cashless devices
- DEX port for accounting and configuration
- MicroSD card for accounting, configuration, and software upgrades
- Drop sensor system ensures that customers receive the product they paid for

This document explains how your vending machine will operate after it has been upgraded using the VMC Retrofit Kit. To get the most out of this document, it is suggested that you finish installing the Kit using the separate installation instructions. Then, proceed with Section 3, “Service Mode Basics”, when you are at the machine.

2 Kit-Specific Information

This document is used with several kits covering different machine types. The Keypad differences and Dip Switch settings for the kits are outlined in the table below:

Kit Type	Up Key	Down Key	Execute Key	Cancel Key	Help Key	Other Differences
RVMC-ROYAL SODA-1L	Sel 1 (Top)	Sel 2	Sel 3	Sel 4	Sel 5	Required settings on VMC board: <ul style="list-style-type: none">• DIP Switch #1 ON• DIP Switch #2 OFF
RVMC-USI SODA-1L	A	B	C	D	H	Required settings on VMC board: <ul style="list-style-type: none">• DIP Switch #1 OFF• DIP Switch #2 OFF (CB500)• DIP Switch #2 ON (CB700) Note – CB500 has no door switch

3 Service Mode Basics

The VMC operates in one of three modes: Sales, Service, or Motor Status. Upon power-up, the VMC enters Sales Mode and remains there unless otherwise instructed. Personnel with access to the machine interior can enter Service Mode to configure the machine and obtain basic accounting information. Motor Status Mode allows route personnel to see and correct motor problems immediately after the door has been closed; see Section 6.4 for more details.

3.1 Entering Service Mode

With the machine turned on and the door open, press the round, yellow pushbutton on the VMC board. You will hear a beep, and the display will change to read either “Sys Errors,” “Main Menu,” or “SD Card Menu.”

If the display reads “Sys Errors”, the VMC has found problems that require your attention. Press the **Down** key to reveal the first error message. If the message “MOTOR ERROR(S)” is displayed, see Section 7.3 for further instructions. Otherwise, press **Execute** to clear the error.

If the display reads “SD Card Menu” see Section 6.7 for further instructions.

3.2 Navigating Service Mode

Think of Service Mode as a series of lists that can be scrolled up and down. A flashing block called the *cursor* shows the current position at all times.

To move around and do things, you will use these five keys (see also Section 2 for definitions):

- Up** to move upward within a menu
- Down** to move downward within a menu
- Execute** to do whatever the cursor is showing right now
- Cancel** to cancel something and return to the previous menu
- Help** displays a “menu” of helpful reminders, in case you forget which key is which

The **Execute** key can “do” several things, depending on where you are in Service Mode:

- It can take you to a lower-level menu (*most common usage*)
- It can perform the listed action (*for example, “Configure and Test Drop Sensor”*)
- It can toggle a particular option on or off (*Options, Clock, and Sales Blocking menus*)
- It can acknowledge an error condition (*Sys Errors and Motor Errors menus*)

The **Cancel** key backs you out of menus. The VMC remembers where you were on the last menu, and returns you to that location. If you press **Cancel** at the Main Menu, the VMC exits Service Mode and returns to Sales Mode.

3.3 Leaving Service Mode

There are five different ways to exit Service Mode:

- Close the door
- Press **Cancel** at the Main Menu (as noted above)
- Press **and hold Cancel** for two seconds, anywhere in Service Mode
- Press the yellow button on the VMC
- Wait for two minutes

4 First-Time Machine Configuration

Before trying to vend products, go to Service Mode and follow these steps to ensure the VMC is configured properly:

4.1 Test Drop Sensor

Go to the Diagnostics menu, scroll down to TEST DROP SENSOR, and press **Execute**. Each time you hit the delivery area with your hand – or with a falling product – the VMC beeps and increments a number on the display. If the VMC fails to detect a knock on the delivery area, or if it beeps continuously, see Section 7.4 for troubleshooting suggestions. Otherwise, press **Cancel** twice to return to the Main Menu.

4.2 Motor Configuration

Go to the Configure Menu and select CONFIGURE MOTORS. This identifies the available motors.

4.3 Set the Clock

On the Config Menu, select SET CLOCK, then select CHANGE TIME. Use the UP and DOWN keys to set each field in the current time (hour, minute, am/pm). Press **Execute** to proceed..

The date may set correctly already. To check it, scroll down one entry and select CHANGE DATE. If the month and date are valid, simply press **Execute**. Otherwise, use the UP and DOWN keys to enter the correct date and press **Execute**. Next, repeat the same process with the two-digit year number.

While still on the Clock Menu, you may wish to modify how the clock is used: the SHOW CLOCK option determines whether the clock appears in Sales Mode or not; use **Execute** to toggle it on or off. There are also options to enable 24-hour time display and automatic Daylight Savings Time correction (for United States/Canada, Europe, Australia, and Mexico).

4.4 Set the Temperature

For machines equipped with temperature control, on the Config Menu, select SET TEMPERATURE. The current temperature setting will be displayed. If needed, use the UP and DOWN keys to set a new temperature setting. Press **Execute** to save the new setting or **Cancel** to restore the current setting.

4.5 Set Motor Links (Space-to-Sales)

A Motor Link (also called Space-to-Sales) allows the VMC to distribute an identical product from several columns. Products are vended successively from each linked column, regardless of which column the customer actually entered.

To establish a link, select LINK MOTORS on the Config Menu, then select ASSIGN NEW LINK. The VMC will prompt you for the starting column number and the ending column number. Since some of the ending column numbers are not directly accessible via selection buttons (i.e. columns 13 and 14) you can use the UP and DOWN keys to adjust the ending column number.

To clear a link, go to the Link Motors menu, move the cursor to the desired link, and press **Execute**.

>>> An alternative to **Set Motor Links** is to use the **STS-OPTIONS** setup as described in **Section 4.10**. <<<

4.6 Set Sales Blocking

Sales Blocking is used to disable vending based on the day of week and time of day. Typically, this feature is used for machines inside schools. Up to four periods can be defined. The periods can even overlap if required.

To enable blocking, select SALES BLOCKING on the Config Menu, then select one of the four available blocking periods. For each blocking period, you are able to set starting time, ending time, the days of the week for which blocking will be active, and the products which will be blocked. Press **Execute** to change a time, to toggle the status of a day, or to toggle the status of a product. When finished, exit with **Cancel**.

The blocking period menu also contains the selections BLOCK ALL ITEMS and EXEMPT ALL ITEMS. The former selection causes all products in the machine to become subject to the blocking period. The latter item causes all products to become exempted from the blocking period, effectively disabling the blocking period.

To deactivate a blocking period, go to the Sales Blocking menu, select the desired period, and toggle all days of the week to OFF. Alternately, the EXEMPT ALL ITEMS selection can be used.

Blocking periods are allowed to extend beyond midnight. In such cases, the VMC uses the day-of-week in effect at the start time to decide when the blocking period ends. For example, consider a blocking period enabled for Monday through Friday for 6:00 PM through 5:00 AM. On Saturday, vending will be disabled from midnight until 5:00 AM because the start time occurred on a Friday, and blocking was enabled on Fridays.

When you have completed all Sales Blocking changes, return to the Config Menu by pressing **Cancel**.

4.7 Set Prices

Exit the Config Menu by pressing **Cancel**. Scroll up to PRICE and select it.

The Price Menu allows you to set prices for the entire machine at once or on an item-by-item basis. Make your selection, then enter the selection number (if applicable). Now, you are able to use the UP and DOWN keys to enter the price. Press **Execute** to save the price or **Cancel** to abandon it.

4.8 Check the Coin Mech

Exit the Price Menu by pressing **Cancel**. If you will use a coin mech, scroll up to FILL / DISPENSE and select it.

This part of Service Mode temporarily enables the coin mech so you can add or remove a few coins using the front panel. If you haven't already done so, add a few coins to the mech. Then, press **the UP and DOWN keys to select a tube (i.e. 1), then EXECUTE** to dispense the smallest-value tubed coin (such as the USA nickel), **2** to dispense the second smallest coin, and so on. If the coin mech responds to the dispense commands, and added coins are displayed at their proper value, then the connections to the coin mech are working properly. Coins deposited at this time will cause a tube count and the coin value to be displayed.

4.9 Check DEX

If you use a DEX audit terminal, you can try it now. Note that the DEX connection is active at all times; you do not have to enter Service Mode to turn it on.

4.10 Set Options

These options are available under the Options Menu if needed for a particular installation. Use **Execute** to toggle the option where the cursor is located.

- **Force Vend:** disallows use of coin return button in most circumstances
- **Multi Vend:** does not return change automatically after a vend
- **Free Vend:** deliver all products in the machine for free
- **Change Bill:** allow patron to receive change for a bill without making a purchase
- **Escrow Bill:** controls whether and how bills are parked while waiting for the customer to add coins or make a selection. Escrowed bills can be returned to the customer, while stacked bills usually cannot.

LAST <i>(default)</i>	Inserted bills are stacked until the maximum price is reached or the total credit can no longer be paid back in coins. When either of these conditions occur, the last inserted bill is held in escrow, preventing
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	further bill insertions.
1st	The first inserted bill is held in escrow, preventing further bill insertions. This setting may be useful where prices are larger than a typical bill. While the customer's payment options are more limited than under LAST , the machine is also less likely to be misused as a change machine.
OFF	Inserted bills are stacked until the total credit can no longer be paid back in coins. When this condition occurs, the last inserted bill is returned. After the maximum price is reached or exceeded, further bill insertions are inhibited.

- **STS-OPTIONS:** provides standard Space to Sales options instead of the Section 4.5 **Set Motor Links (Space-to-Sales)** way of setting it up.

1 - 8	Selects Options 1 - 8 from table below.
OFF	Machine reverts to Section 4.5 Set Motor Links (Space-to-Sales)

Selection	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8
1 / A	1,2	1,2,3	1,2,3	1,2,7	1	1,2,7,8	1,7	1
2 / B	3,4	4,5	4,5	3	2,3,8	3,4	2,8	2
3 / C	5	6	6	4	4	5,11	3,9	3
4 / D	6	7,8	7	5	5	6,12	4,10	4
5 / E	7	9	8,9	6	6	9	5,11	5
6 / F	8	10	10	8	7	10	6,12	6
7 / G	9	11	11	9	9	13	13	7
8 / H	10	12	12	10	10	14	14	8
9 / J	11	13	13	11	11	NONE	NONE	9
10 / L	12	14	14	12	12	NONE	NONE	10
11 / N	13	NONE	NONE	13	13	NONE	NONE	11,12
12 / P	14	NONE	NONE	14	14	NONE	NONE	13,14

- **DEX Support:** determines how the VMC communicates over the DEX port:

V6 (default)	Use EVA-DTS 6.x communication and reporting conventions.
V5	Use EVA-DTS 5.0 communication and reporting conventions. Select this option only if your auditing system has problems communicating with the VMC under the "V6" setting.

- **Remote Price:** determines remote pricing options

Sel (default)	Set price by Selection ID (DEX Audit Field ID105 = 1)*
Idx	Set price by Index (DEX Audit Field ID105 = 0)*

* The current setting is reflected in the DEX Audit field ID105.

- **Advanced Options:** used for setting up additional machine options

- **No-Cheat:** prevents a customer from losing funds, especially after a vend failure.

ON	A vend will only be attempted if the customer's funds can be returned.
OFF	A vend will occur; however, the maximum cheat amount is limited to the smallest bill value (usually \$1). As an example, you can't vend with the \$5 bill with no change in the coin mech.

- **Motor Scan:** determines if the motors will be scanned when exiting service mode or when the door is closed.

ON	Motors will be scanned when exiting service mode or when the door is closed.
OFF	Motors will not be scanned when exiting service mode or when the door is closed.

- **Motor Detect:** performs a motor detection check at each vend start and declares motor missing on failure.

ON	Performs motor check.
OFF	Does not perform motor check

- **Sensor Disable:** feature not applicable to soda machines. Leave at factory setting of **4**.
- **Sensor Security:** feature not applicable to soda machines. Leave at factory setting of **10**.

5 Sales Mode

This section describes the typical operation of Sales Mode as well as some optional behaviors and features.

5.1 Typical Operation

Under normal circumstances, when the machine is idle, the Sales Mode display consists of the message **“INSERT MONEY”** optionally followed by the current time. When credit is inserted, the display shows the word **“CREDIT”** followed by the credit amount. If a selection is attempted without sufficient credit, the display shows the full price of the item.

Several other idle messages may be displayed under special circumstances:

- **“USE EXACT CHANGE”** alternates with **“INSERT MONEY”** when a low change condition is detected or if the coin mech becomes inoperative. Low change is defined as all coin tubes empty (if no bill validator is present) or less change than the smallest-value bill (if bill validator is present). This message can also appear at time of selection if the coin mech does not have the proper coins to pay back either the inserted credit or the change for the selection.
- **“NO SALES UNTIL hh:mm”** appears when the Sales Blocking feature has disabled vending for a product based on the day of week and time of day. If all products in the machine are being blocked, this message replaces **“INSERT MONEY”** for the duration of the block.
- **“FREE VEND”** appears in place of **“INSERT MONEY”** if the machine-wide Free Vend option is enabled.

If all payment devices become inoperative or if other machine-wide failures occur, the VMC will display **“OUT OF SERVICE”** and disable all payment devices. See Section 7 for tips on troubleshooting these conditions.

5.2 Delivery Chute Drop Sensor

The VMC is able to verify whether a product actually dropped during a vend. If no product drop was detected throughout the entire vend, the VMC displays the message **“PLEASE MAKE ANOTHER CHOICE.”** On cash vends, the customer can then try a different selection or press coin return to get their money back. On some card (cashless) vends, the customer’s card is returned automatically, but the customer is able to re-insert it immediately.

5.3 Temperature Display (with door closed)

For machines with refrigeration control, the current temperature and set temperature can be displayed by pressing any selection button or key for ~5 seconds. The temperature information will be displayed for ~10 seconds.

5.4 Bill Validators and Exact Change

The VMC evaluates change conditions in the coin mech when deciding whether to enable or disable the bill validator. Essentially, the VMC looks ahead and predicts what would happen if the customer inserted the smallest-value bill right now. If there would not be enough change to vend any product in the machine, or if there would not be enough change to pay back the inserted bill, the bill validator will be disabled and an **“EXACT CHANGE”** message will be displayed.

If you are testing a bill validator, be sure that the coin mech has enough coins to equal the smallest-value bill – but never less than 10 coins in a tube – to allow the VMC to enable the validator.

5.5 Card Revaluation

Certain MDB card (cashless) readers are able to increase the value stored on a customer’s payment medium (card, key, or button) under VMC control. The VMC detects and supports such readers automatically. The VMC supports two slightly different forms of revaluation, depending on whether the customer inserts cash or card first:

1. “Cash First” revaluation: If the customer inserts a card when there is a cash balance, the VMC attempts to transfer the cash balance to the card, up to the card’s revaluation limit. Any excess cash balance is paid out in change. If the revaluation is successful, the message **“CREDIT ADDED TO CARD”** will appear. Otherwise, the card session is ended, causing a physical eject on some readers.
2. “Card First” revaluation: In this scenario, the customer inserts cash after a card has already been inserted. When the customer presses coin return, presses the reader’s cancel button, or makes a vend selection, the VMC tries to transfer the cash balance to the card, up to the revaluation limit. Any excess cash balance is paid out in change. If the revaluation is successful, the message **“CREDIT ADDED TO CARD”** will appear. Otherwise, the card session is ended, causing a physical eject on some readers.

6 Servicing the Machine

This section highlights some VMC features that can make routine machine servicing easier.

6.1 Checking Coin Tube Levels

In Service Mode, choose FILL/DISPENSE at the Main Menu. Either insert a coin of each type through the coin slot, or use the UP and DOWN keys to select **1**, **2**, **3**, and **4**, then EXECUTE to dispense a coin of each type. In either case, the display will show the number of available coins of that type.

If you need to remove a large number of coins, it is usually faster to do so directly at the coin mech. Many coin mechs offer a repeating dispense feature that is faster than requesting the same dispenses from the VMC. Note that DEX accountability will not be maintained for dispenses initiated from Micromech coin mechs.

6.2 Accounting

The Accounting Menu provides audit counters that are accessible to service personnel, yet are completely separate from DEX activity. “**HISTORICAL VENDS**” and “**HISTORICAL VALUE**” show the number and amount of paid vendes over the lifetime of the VMC. “**RESETTABLE VENDS**” and “**RESETTABLE VALUE**” are resettable versions of the same counters. Counters labeled “**CARD**” show only cashless payments, while counters labeled “**TOKEN**” show only token payments. Select the “**CLEAR ALL**” item when you wish to clear the resettable counters.

6.3 Manual Motor Testing

To test a motor without changing any of the accounting data, go to the Diag Menu and select “**TEST MOTORS**.” You can test either a single motor or all motors at one time. Watch the display for any error messages that may appear.

Each tested motor will run for about one-third of a second.

6.4 Delivery Chute Drop Sensor Testing

Automatic scanning for Delivery Chute Drop Sensor takes place at door closure (for machines with door switches), and when leaving Service Mode. If the Delivery Chute Drop Sensor is detected, the VMC emits a long beep and displays the message “**SENSOR ERROR**.”

6.5 Automatic Motor Testing

If enabled, automatic scanning for motor problems takes place at two times: at door closure (for machines with door switches) and when leaving Service Mode. If no problems are seen, the VMC double-beeps and returns to Sales Mode. If problems are detected, the VMC enters Motor Status Mode.

Automatic Motor Testing is enabled or disabled with the **Advanced Option Motor Scan** described in **Section 4.10**. Note that the motor testing moves the motor slightly and is not recommended for machines that have double cans in a column. The second one can drop unintentionally after a few motor tests.

In Motor Status Mode, the VMC progressively displays all failed motor designations in the machine. If all configured motors on a given tray have problems, only a tray designation is displayed. The only key entry permitted is **Execute**, which re-scans for motor problems. If the re-scan finds that all motor problems have been resolved, the VMC will double-beep and return to Sales Mode. If no door or keypad activity is detected within a short time, the VMC will emit five short beeps and return to Sales Mode.

Here is an example of a display sequence from Motor Status Mode:

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*MOTOR ERROR(S)*      *MOTOR ERROR(S)*
```

6.6 Temperature Display

For the Royal 650 and USI CB700 machines with temperature control, when the top of the main service menu on the display looks like:

MAIN MENU

Press 5 for Help (Royal 650) or **Press H for Help** (USI CB700)

If you press the first selection the current temperature and setting is displayed for a couple seconds.

6.7 MicroSD Card Features

The VMC contains a MicroSD socket which can assist in transferring accounting, configuration, and firmware data to and from the machine. MicroSD cards of up to 32 GB capacity may be used. Regardless of the brand of card, it must be formatted with a FAT12, FAT16, or FAT32 file system.

When a MicroSD card is inserted in Service Mode and that card contains a bi2 file, the NEW FIRMWARE function will automatically start.

NEW FIRMWARE will allow new VMC firmware to be read from the card. In order to complete this operation, you must have transferred the firmware file (always ending in the extension .BI2) onto the card through some other Internet-connected device. For best results, use a PC to transfer the file onto the card. Several things will happen in quick succession: 1) current machine settings are saved, 2) the new firmware is programmed, and 3) the new firmware reads the machine settings and starts up.

If a bi2 file is not on the card, a menu appears with three card-specific options:

- SAVE AUDIT
- LOAD CONFIG
- SAVE CONFIG

SAVE AUDIT creates a DEX audit file on the card containing the same report that is transmitted through the ¼" DEX jack. The file name will be automatically chosen based on this pattern: *Acccc_nn.TXT*, where "ccccc" is the last 4 characters of ID101 (typically the VMC serial number) and "nn" is a number that increments from 00 to 99.

LOAD CONFIG reads a configuration file containing machine settings such as pricing. The file – which must end in the extension .CFG – can be generated by the SAVE CONFIG function on this or another VMC. DEX-standard records such as IC5, PC1, and SD1 are also accepted in the file. In the menu, use the **Up** and **Down** keys to view the available files, then **Execute** to select the highlighted file.

SAVE CONFIG saves all of the machine settings into a filename of your choice. The filename may consist of 1 to 8 characters; an extension of .CFG is automatically added. To enter the filename, a telephone-like selection system is used: by repeatedly pressing one of the machine's number keys, you can select the different letters or symbols available on that key. By pausing a moment, the selected character is confirmed and you can enter additional ones if needed. The Cancel key will erase the last character, and the Execute key will confirm the entire filename (unless the filename is blank). The characters mapped to each number key are:

- | | |
|---------------|----------|
| 1: -_!\$&#%'1 | 6: MNO6 |
| 2: ABC2 | 7: PQRS7 |
| 3: DEF3 | 8: TUV8 |
| 4: GHI4 | 9: WXYZ9 |
| 5: JKL5 | 0: 0 |

7 Troubleshooting

This section highlights some Service Mode features that help detect and recover from machine failures.

7.1 Error Display

As mentioned earlier, the VMC automatically displays detected errors upon entry to Service Mode. Like other parts of Service Mode, “Sys Errors” is a scrolling menu: if several errors are outstanding, the menu will expand to hold the entire list. Use **Down** and **Up** to navigate the list. To clear motor errors, see Section 7.3. To clear other types of errors, press **Execute**.

All errors initially appear as two-line entries on the display. For example, consider the following display: “MOTOR ERROR(S) 0002 08/13 09:34”. This indicates that two motor errors have been recorded, and that the first one occurred on August 13th at 9:34 AM.

The following table lists all errors along with possible resolutions:

Error Name	Origin	Resolution
BV CHECK SUM	Bill Validator: internal problem has occurred in the firmware.	Repair or replace bill validator.
BV COMMUNICATION	Bill Validator, VMC, or cabling: communications between VMC and validator stopped unexpectedly.	Ensure cabling between VMC and validator is secure, with no broken wires. In unusual cases, bill validator or VMC may need to be replaced.
BV JAMMED BILL	Bill Validator: a bill has jammed in the acceptance path.	Remove the jammed bill.
BV MOTOR	Bill Validator: one of the motors has failed.	Repair or replace bill validator.
BV OPEN BOX	Bill Validator: cash box was removed while the machine door was closed.	Remove any foreign objects from the validator. Ensure that the cash box is firmly seated on the validator. Check that the machine’s door switch is connected properly to the VMC. Ensure that the machine door switch is not stuck closed.
BV SENSOR	Bill Validator: one of the sensors has failed.	Repair or replace bill validator.
BV STACKER FULL	Bill Validator: cash box is full.	Empty the cash box.
CC CHECK SUM	Coin Mech: internal problem has occurred in the firmware.	Repair or replace coin mech.
CC COMMUNICATION	Coin Mech, VMC, or cabling: communications between VMC and coin mech stopped unexpectedly.	Ensure cabling between VMC and coin mech is secure, with no broken wires. See also Section 7.2. In unusual cases, coin mech or VMC may need to be replaced.
CC JAMMED TUBE	Coin Mech: a payout tube has jammed.	Check for coin jams. On mechs with removable cassettes, ensure that the cassette is seated properly.
CC SENSOR	Coin Mech: one of the payout tube sensors is behaving abnormally.	Repair or replace coin mech.

CC UNPLUGGED	Coin Mech: the acceptor module seems to be missing.	Repair or replace coin mech.
CR CARD ERROR	Card Reader: the payment media is defective.	This is an informational message; the problem may be limited to one particular payment medium.
CR COMM - MINOR CR COMM - MAJOR	Card Reader: a communications problem occurred with or within the reader. Problem is either recoverable ("MINOR") or non-recoverable ("MAJOR").	Ensure cabling between VMC and reader is secure, with no broken wires. Repair or replace card reader.
CR INVALID CARD	Card Reader: payment media problem.	This is an informational message; the problem may be limited to one particular payment medium.
CR JAMMED CARD	Card Reader: payment media has jammed inside the reader.	Clear the jam.
CR READER FAIL	Card Reader: an unspecified problem developed within the reader; device is not presently functional.	Repair or replace card reader.
CR REFUND FAIL	Card Reader: funds could not be credited to the payment medium following a failed vend; funds were lost.	Determine if problem is limited to one particular payment medium. Repair or replace reader if problem affects more than one payment medium.
CR SERVICE SOON	Card Reader: reader device requires maintenance.	Perform maintenance as recommended by reader's manufacturer.
CR TAMPER	Card Reader: a security breach has been detected.	This is an informational message.
MOTOR ERROR(S)	VMC: a vend motor is missing, jammed, or has a defective home switch.	Press the Execute key to see a detailed list of motor problems. See Section 7.3 for more information.
STUCK KEY	VMC: a key has been depressed for an abnormally long time.	Repair or replace machine keypad.
SENSOR ERROR	VMC: Drop Sensor system was found to be on.	See Section 7.4 for more information.
SENSOR SECURITY	VMC: an unusual number of missed product drops were detected.	Check sensor and related cabling for signs of tampering. See Section 7.4 for sensor testing procedures.

7.2 Payment System Errors

As noted earlier, the VMC displays the "OUT OF SERVICE" message in Sales Mode if all payment devices become inoperative. If an individual payment device becomes inoperative, the VMC will continue without it. In the case of a coin mech failure, the loss of change-making capability may make the machine unusable even though it technically remains in service.

On some machines, the MDB coin mech is connected to the VMC through an existing machine harness. In these situations, it is helpful to unmount the coin mech and plug it into the VMC board directly. By bypassing the machine harness, you can help determine whether the coin mech, the harness, or the VMC itself is at fault.

7.3 Motor Errors

When “**MOTOR ERROR(S)**” appears, one or more motors have been disabled due to detected error conditions. To view the list of problem motors, press **Execute** to view the Motor Error menu, then press **Down**. The following three letters are used on the error reports:

- “M” indicates that a motor was present when the machine was configured, but was missing when last checked.
- “J” indicates that the motor drew an excessive amount of current, and is probably jammed.

To re-test a defective motor, press **Execute**. If the error has been resolved, it will be removed from the menu. On the other hand, if the error persists, the entry on the Motor Error menu will remain. Any motor appearing on this menu cannot be used for vending until the problem is resolved.

7.4 Delivery Chute Drop Sensor Errors

As noted in **Section 6.4**, the VMC can detect a Delivery Chute Drop Sensor problem. A “**SENSOR ERROR**” indicates that the sensor adjustment trim pot is not set correctly, a cabling problem exists, or an electronic failure has occurred.

The Delivery Chute Drop Sensor has a red LED associated with it on the control board. It's located to the left of the sensor adjustment trim pot (near bottom right corner). The trim pot was set at the factory so no adjustments are typically needed, but if so, perform either of the following steps.

LED on Continuously / Flickering

If the LED is on continuously or flickering, the trim pot should be rotated clockwise using a small screwdriver. Rotate the trim pot slowly until the LED goes out. Verify that the chute sensor is working by tapping on the delivery chute with a hard object. The LED should flash each time the chute is tapped. If the LED does not go out, the control board, the sensor, or the cable connection between the VMC and the sensor is defective.

LED Does Not Come ON (When Products Vended)

If products are being vended, but not detected by the Delivery Chute Drop Sensor, the trim pot should be rotated counter-clockwise using a small screwdriver. Rotate the trim pot until the LED comes on. Then rotate the trim pot very slightly clockwise until the LED goes out. Verify that the chute sensor is working by tapping on the delivery chute with a hard object. The LED should flash each time the chute is tapped. If the LED does not go out, the control board, the sensor, or the cable connection between the VMC and the sensor is defective.

IMPORTANT: After resolving a sensor error, be sure to clear the error in Service Mode to restore the Drop Sensor to full operation.

7.5 Other Types of Errors

The remaining error types are simple notifications; you press the **Execute** key to acknowledge that you read them. If you don't acknowledge these errors, they will keep appearing until you do. These errors do not cause the machine to go out-of-service.

7.6 Machine History Logs

The VMC maintains a history of door and power events it has observed. To access these logs, go to the Diag Menu and select VIEW POWER LOG or VIEW DOOR LOG. In each case, the logs are shown starting from the most recent event and moving backwards in time, up to 10 events deep. Once the end of the log has been reached, scrolling down will cause the most recent event to be displayed again.

8 Service Mode Quick Reference

Note: In the text below, **Key H** is used for the USI machines. **SEL 5** is used for the Royal machines.

