



CARDLOCK VENDING



## CardMaster Programming Guide

Rev 10.06.03

Related Manuals include:

CardMaster Operators Guide

CardMaster Installation Manual

CardMaster Service Guide

CardMaster RF Installation Manual

Wireless Modem Setup Manual

Programming Guide for CardMaster fuel control

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## PROGRAMMER'S GUIDE

This programmer's guide will aid you with the initial set up and programming of your CardMaster fuel control system. Before you get started, you will need the following:

9-pin serial cable (male by female) or a USB to Serial Interface cable  
Personal or laptop computer with HyperTerminal or other suitable terminal emulation program. HyperTerminal is standard in Windows® programs up to Windows XP, usually on the menu under "Accessories", and then "Communications" or "System Tools." For Windows® Vista or Windows® 7, HyperTerminal must be purchased.

Terminal emulation program set up to these parameters:

### DIRECT SERIAL CABLE

Baud rate = 9600  
Data bits = 7  
Stop bits = 1  
Parity = Space  
Flow control = none

### USB to SERIAL

Baud rate = 9600  
Data bits = 8  
Stop bits = 1  
Parity = none  
Flow control = none

Once your computer is successfully configured, connect to the CardMaster. To log in, press the 'P' key. (NOTE: if you have a memory failure, or a new EPROM, then you need to press the reset button on the CPU board, or "r" on HyperTerminal, prior to obtaining password access.) The CardMaster will respond:

**Password:** \_

At this point, type in your password, or the factory programmed password; which is MASTER. This password is case sensitive, and must be all capitalized letters.

As you are typing, the entries will appear as an asterisk (\*). A successful entry will be followed by an exclamation (!), an invalid entry will be followed by a question mark (?).

A successful password entry would look as follows:

**Password:** \*\*\*\*\*!

**Cardlock Vending Fuel Site Controller V1.0 #BA12345**

:

A colon ':' followed by a flashing cursor is the indication of being logged in and waiting for commands. The V1.0 refers to the software version. The string of letters numbers to the right of the version is the serial number of the unit.

**NOTE: As a security precaution, the CardMaster will not accept even correct password entries after 3 unsuccessful password attempts in a row. This lockout will require a reset (typing "r" in terminal emulation prior to attempting a "P" command). The response to the "r" should be a "power up" message on the screen.**

To get a list of command functions, you may enter a '?' at the prompt. Below is a table of the command functions available. The table is brief, and explanations follow.



The following commands are single letters. Do not hit enter after the command.

Note: On systems with new processor boards, or being set up for the first time, Shift # will clear all memory registers, and set all defaults to the default value. This is recommended, only at this time.

**D --Set Date and Time.** This command will show you the current date and time (24 hour clock) followed by a prompt. Enter the date in the format HH:MM with H = hours and M = minutes. Be sure to separate hours and minutes with a colon. To enter the date, enter one space after the time entry and enter the date in the format DD-MM-YY with D = day, M = month, and Y = year. Each entry requires 2 digits and they are separated by a hyphen. To enter a date and time, first strike the 'D' key. The following prompt will appear:

**Current Date and Time: 6:00 12-31-00**  
**New Date and Time (HH:MM MM-DD-YY) :**

The first line tells the current date and time. Note: the leading zero (0) is dropped in displaying times from midnight to 10 am. To enter a new date and time of 1:37 pm on January 1, 2002 (for example) would be:

**13:37 01-01-02**

**E – Enter PIN.** This command allows you to authorize or disable cards from being used, to bypass the PIN function from the card-users menu, and to enter PINs for active card users.

After E is entered at the prompt, the screen will read

**Card # :**

Enter up to a 3 digit number. If you want to enter a PIN for card 001, just enter '1' then press enter when done. Screen with prompt with the current PIN and follow with:

**Card # : 1 PIN # (9999) :**

The above example shows a current PIN for card 1 as 9999 - i.e. no PIN required to access system. Input a new PIN or press enter to keep the existing PIN. If you enter a new PIN, the computer will increment to the next card number. If you do not wish to change the next card's PIN, simply hit enter.

To deactivate a card so that it cannot be used in the system, set the PIN to zero (0) All cards (except the first 5 testing cards for initial set up and operations test) are set to zero at the factory.

To bypass the PIN requirement, enter the PIN 9999. This will allow the card user to go directly to the user prompt or the pump prompt depending on how the card is programmed.

### **C - Last card entered.**

This command displays the last card read by the magnetic stripe reader. This function is good for verifying how a card is programmed.

**H - Hose Configuration.** This command allows the user to enter the pump/dispenser information of pump number, pulse rate, and product code. The CardMaster is capable of controlling 2 hose positions (also know as pumps, dispensers, or nozzles). The CardMaster refers to these as 'Hose Positions'. To edit the hose configuration press 'H' at the prompt, the following will appear:

**Hose 1 position, 0 = off, 1 to 9 (1) : \_**

This entry is the pump number that must be entered to begin fueling. Typically, the number assigned to a fuel pump is marked on the face of the pump. The relays for hose position 1 are labeled as Pump 1 on the I/O board (against the back wall of CardMaster). To deactivate the pump electronically, enter zero (0). To assign this hose position a pump number, enter 1 through 9 then press 'enter'. The (1) indicates the pump number currently defined.

**Hose 1 product (1) : \_**

This entry assigns a product number to the hose. The product numbers are used to identify the type of product dispensed (diesel, unleaded, motor oil, etc.) This code can be used to authorize access to specific products (as defined by the user's card). The specific product is defined by the user in the data base management program. The (1) indicates the current product number. To enter a product number, press the desired number and press enter. The following prompt will then appear:

**Hose 1 pulses/unit, 1,10,100,1000 (10) : \_**

This is the pulser divide rate assigned to Hose 1. The (10) indicates that the pulse rate currently is 10:1 for this fuel dispenser. To change the pulser divide rate enter in one of the numbers listed above and press enter. This completes entries for hose 1. Hose 2 will follow with the same questions as shown. Follow the same principles as above for Hose 2.

**Hose 2 position , 0 = off, 1 to 9 (2) : \_**

Note: the pump number for hose 2 cannot be the same as hose 1!

**Hose 2 product (2) : \_**

**Hose 2 pulses/unit, 1,10,100,1000 (10) : \_**

**K - Key Pad Entry.** Keypad card entry enables the ability to perform a fueling transaction using only the keypad for entering data (card-less operation). This field allows keypad entry to be enabled or disabled. “Disabled” means the system will require a card to be swiped to initiate a transaction, and the LCD displays “**Swipe Card**”. When the keypad card entry feature is enabled the system can be used card-less, or with a magnetic striped card. When the keypad card entry feature is activated, the LCD screen message will read ‘**Card or Keypad**’. (The appropriate message will alternate with the main screen message described further below). ***In a cardless entry, there will not be any expiration, quantity limit, or product restriction.*** After ‘K’ is entered, the following appears:

**Keypad card entry, Y or N (Y) :**

This field enables or disables the keypad entry function. The (Y) in this example demonstrates that keypad card entry is currently allowed (enabled). To disable the system, type ‘N’ for no keypad entry allowed, or ‘Y’ for yes allow keyboard entry. Press enter after letter input. The next screen entry is:

**Keypad entry prompt, 0 = off, 1 to 9 (1) : \_**

By entering a zero (0), this prompt will be skipped. The keypad entry prompt is the user prompt that will appear after the PIN number is entered for a card. An entry of 1 will prompt for ‘ODOMETER’, an entry of 2 will prompt for EMPLOYEE #, etc. See U - User Prompt for a complete list of available prompts. This field allows up to 6 digits to be entered by the card user prior to obtaining fuel. The (1) shows the prompt currently selected.

**Keypad maximum qty. (XXXX) : \_**

This entry sets the maximum number of units that can be obtained per “card-less” (key pad entered) transaction. This limit applies to all key pad entered (card-less) transactions. If a limit of 100 gallons per transactions is required, enter ‘100’ and press enter. The maximum is 9999. An entry of zero (0) will not allow you to dispense fuel on any card-less keypad transactions. Therefore, a value greater than zero is required.

**G – GateControl** ***This command changes the CardMaster to a GateController.*** The unit can be either a **CardMaster** – or – a **GateController**. When set as a GateControl the unit will offer higher end functions than those available in our **GateMaster** product. These include:

- 1 door, or 2 door control
- Key-pad access (card-less operation)
- Recording of “Entry Code” fields such as Odometer, Vehicle #, etc
- Card and PIN control for higher security

**I – System ID.** This command allows you to see the system ID in the field. The System ID is fixed at the time of manufacture. The Site ID is set at the time of install by the user.

**M - Main Screen Message.** The main screen message is the LCD screen message that alternates with the ‘**Swipe Card**’ or ‘**Card or Keypad**’ message. This message can be used to remind people of rules, ownership, events, etc. This can be any message up to 16 characters/numbers long. To center the message insert spaces before the message. A message of CARD-MASTER would be entered in as ‘---CARDMASTER---’ (the ‘-’ represents spaces). The spaces following the text are automatically added by the CardMaster, but were shown here for clarity.

**P - Password.** This field allows the user to enter a unique password. Strike the ‘P’ and the following prompt will appear:

**User password ( MASTER\_ ) :**

The password can be up to 6 characters. Take care to memorize or record your password in a secure location! The factory default password is the word ‘MASTER’ (in all capitals). This is represented in the example in parenthesis above. Enter the new password and press enter. The entry will be case sensitive. At the prompt, again press ‘P’ to verify the password. The current password will appear in the parenthesis.

**Note:!** If you lose your password, contact Cardlock Vending for assistance immediately.

**NOTE:** As a security precaution, the CardMaster will not accept even correct password entries after 3 unsuccessful password attempts in a row. This lockout will require a reset (typing “r” in terminal emulation prior to attempting a “P” command). The response to the “r” should be a “power up” message on the screen.

**U - User Prompt.** The user prompt is a 9 character message that appears after the PIN is entered asking user for up to 6 digits of information. If one of the predefined prompts does not meet the requirements, 5 fill-in-the-blank prompts are available. Press ‘U’ and the following will appear:

- User prompt #2: 0
- User prompt #3: 0
- User prompt #4: 0
- User prompt #5: “enter user specified field”
- User prompt #6: “enter user specified field”
- User prompt #7: “enter user specified field”
- User prompt #8: “enter user specified field”
- User prompt #9: “enter user specified field”

Zero indicates this prompt is turned off. You can enter a user prompt that is customer defined in prompt 5,6,7,8 and 9.

In this example, the last entry in this field is badge number. This entry will appear as a prompt when the user’s card has a ‘5’ in the entry code field, or if the manual transaction code is set to

5. Type up to 9 characters. This message repeats for prompts 6 through 9. User prompts include:

Code	Field Size	Field Descriptions – LCD displayed prompt topic
0	1 to 6 digits	<b>By-passes the entry code</b> , and prompts the next step “Enter Pump”
1	1 to 6 digits	Odometer reading
2	1 to 6 digits	Employee ID number
3	1 to 6 digits	Vehicle Number
4	1 to 6 digits	Misc. #
5	1 to 6 digits	<b>* Job Number (user program, these are suggested entries)</b>
6	1 to 6 digits	<b>* Invoice Number</b>
7	1 to 6 digits	<b>* Facility Number</b>
8	1 to 6 digits	<b>* Group Number</b>
9	1 to 6 digits	<b>* Job Number</b>

**V - Timer Values.** This function sets the maximum time (in seconds, or number of errors) that a particular condition remains in effect before the CardMaster times out and terminates the transaction.

After striking the 'V' the following will appear:

**Max off hook delay ( 60 ) :**

This timer sets the maximum time (in seconds) allowed to remove the pump handle from the fuel dispenser before the transaction is terminated. Allow adequate time for the person swiping the card to walk from the CardMaster to the fuel dispenser and begin fueling. In the example above, the last programmed value was 60 seconds. The largest number of seconds is that can be entered is 255. A value of zero (0) allows an infinite amount of time to begin fueling. To set a value, type in the number of seconds for the maximum time allowed to begin fueling, and press enter. The next timer value will appear like this:

**Missing Pulse Delay (60) :**

This timer sets the maximum time (in seconds) allowed without pulses being received. This timer begins as soon as the fuel dispenser comes off hook. This type of error occurs when the nozzle has been left in the tank and not hung up in the given time, or a defect in the pulser circuit occurred. In the example above, the last programmed value was 60 seconds. The largest number of seconds is that can be entered is 255. A value of zero (0) allows an infinite amount of time between pulses (transaction would not end unless nozzle hung up in dispenser). To set a value, type in the number of seconds for the maximum time allowed between pulses and press enter. The next timer value will appear like this:

**Max pulse errors ( 5 ) :**

This is the maximum number of missing pulse errors in a row allowed before a hose is disabled, or taken out of service. To return the unit to service after being repaired, go to the 'H' command and change the appropriate hose position from zero (0) to its proper dispenser number. In the example above, the last programmed value was 5 errors. The largest number of consecutive errors is 255. A value of zero (0) allows an infinite number of errors. To set a value, type in the maximum number of pulse errors in a row before the CardMaster disables the offending hose.

## Advanced Programming Features

The following are the advanced program features of the CardMaster. These features allow polling of data, transaction review, reprinting of transactions, and system wide features. **Caution: Some of these features cause system wide irrevocable changes. Do not perform these functions unless you are certain.**

### **A - Download entire transaction memory.**

This command downloads all transactions in memory. This includes transactions previously sent. The data will be sent via the serial port on the I/O board. This function is intended as a data recovery tool should the host computer experience a data failure. The maximum number of transactions stored in the CardMaster is approximately 1900. Once this number of transactions is reached, the oldest transaction will be overwritten and destroyed.

### **B - Download transactions from last marked.**

This command downloads all transactions from the point of the last marked transaction. The last marked transaction is set by the 'X' command following successful data transmission.

### **F - Print last ## of transactions.**

This command will force transactions to print on the printer. This function is used to reprint transactions when the printer fails to print properly. At the CardMaster prompt, hit 'F' and this will appear:

**# to print or ENTER**

Enter the number of transactions you want to print out. These will be the most recent transactions.

### **J - Dump system set up.**

This command will send the CardMaster system parameters to the serial port. File can be archived for reference or on-line help. Information includes date, time, timer values, hose information, keypad entry parameters, main screen and user prompts.

### **L - Print last transaction to screen**

This command will send the last transaction to the serial port so it can be seen on the screen. Especially useful when diagnosing pump errors and verifying that repairs have been completed satisfactorily.

## **N - Download card/PIN table**

This command sends 200 card numbers and their associated PIN number to the serial port. This can be saved to a file and used to re-enter PIN numbers should a memory failure occur in the CardMaster. **Caution: PIN file should be stored in a secure location!** To download the PIN table, type N at the prompt and the first 200 cards and PIN will download. Note: The PIN in your system will not match this example. The card/PIN table format will look like this:

```
001,0001,0002,0003,0004,0005,0006,0007,0008,0009,0010
011,0011,0012,0013,0014,0015,0016,0017,0018,0019,0020
021,0021,0022,0023,0024,0025,0026,0027,0028,0029,0030
etc.
(Card/PIN/PIN/PIN/PIN/PIN/PIN/PIN/PIN/PIN/PIN)
```

To obtain the next 200 cards and their PINs, hit any key. To stop card/PIN download, hit escape.

## **S - Save changes**

The 'S' command saves changes made while online. You can save data anytime by typing an 'S' at the prompt. Before exiting the system, **you must enter S or data will be lost! Failure to save entries can cause a memory failure when check sums are verified by the system during brown-outs and power failures.**

Note: some data saves automatically upon entry (PIN for one example). Make sure all of your entries are correct before you save and exit.

## **X - Mark last transaction downloaded.**

The 'X' command allows the last successfully polled transaction to be marked. The 'B' command will start at the transaction following the last marked and bring in all data since that point. By marking the last successfully polled transaction, duplicate records and polling time can be reduced. **Note: The CardMaster data polling package will automatically update the last transaction.** To set the last transaction, type 'X' at the prompt. Enter in the 4 digit number of the last transaction in the current file and press enter. To view the last marked transaction type "X" and press "enter" key. The command "X" followed by "=" and "Y" will mark the last transaction polled as the new mark.

**Y – will display the last transaction polled.**

## **‘Escape’**

The ‘Escape’ (Esc) key can be used at any time to end an entry and return to the prompt.

## **‘Shift =/+’ Sets all PIN to 9999**

Setting all PIN to 9999 will bypass the PIN requirement for all cards. **Caution: This function will overwrite all PIN currently in memory.** Simultaneously striking the ‘shift’ and ‘=/+’ keys at the prompt will bring up a message:

**Set PIN for ALL cards to 9999 (PIN not needed for ANY card)? (Y or N)**

If Y is entered, the program will respond ‘done’ and all PIN will be 9999. If N is entered the program will respond ‘aborted’.

## **‘Shift -/\_’ Sets all PIN to zero (0)**

This command will change all PIN to zero (0) thereby preventing all cards from being used. This function is used on system start up to disable all cards prior to activating the desired cards. **Caution: This function will overwrite all PIN currently in memory.** Simultaneously striking the ‘shift’ and ‘-/\_’ key at the prompt will bring up the message:

# **ERROR CODES**

Transaction error codes can include:

- 0 In Progress – sale not complete**
- 1 Normal Transaction – sale completed normally**
- 2 time out - user**
- 3 time out – no pulses received**
- 4 time out – no pump handle**
- 5 sale terminated – by quantity limit**
- 6 invalid memory – product code, etc**
- 7 Invalid card, card expired, bad card read, invalid PIN (after 3<sup>rd</sup> PIN attempt)**
- 8 Invalid hose or product (wrong selection, or invalid read of product)**
- 9 Tally full (no room for more transactions, exceed memory limit, or “x” command is marked incorrectly)**
- A Power Fail, lost AC connection**
- B Power Fail while dispensing is in progress**
- C Entering manual mode**
- D Leaving manual Mode**

This is an attempt to further explain the error codes. When a zero quantity transaction occurs, the product code field is used to further identify the type of error. This list should be used to append the main error list. Only Transaction codes equal to 2, 7, & 8 have expanded diagnostics.

T = Transaction type  
H = Hose number  
P = Product code

T H P

- 2 0 \*      \* When T = 2 , this indicates a transaction timed out  
            When P = 2, this indicates a remove card timeout (too long to swipe card)  
            When P = 3, this indicates a PIN not entered in (or enter pressed) in time.  
            When P = 9, this indicates a User prompt not entered in time
  
- 7 0 \*      \* When T = 7, indicates a card read error  
            When P = 0, indicates system ID error  
            When P = 1, indicates card read conversion error  
            When P = 2, indicates Invalid Card (card turned off)  
            When P = 3, indicates card expired  
            When P = 4, indicates Invalid PIN
  
- 8 0 \*      \* When T = 8, indicates a hose selection error  
            When P = 0, indicates an invalid hose selection (hose not defined)  
            When P = 1, indicates an invalid product.  
            When P = 2, indicates a restricted product (user not allowed to get product)

You can get transactions (even zero transactions) in other codes that have hose and product information. A code of 4 1 1 is an off hook time out where the user had a successful swipe and got through the enter pump, but did not pick up the handle. This would give you a 4 1 1 code with accurate information

Invalid Card Message: Can yield one of 5 messages:

- T H P
- 7 0 0 = System ID read error
- 7 0 1 = Card read conversion error (garbage read)
- 7 0 2 = Invalid Card (card turned off)
- 7 0 3 = Expired Card
- 7 0 4 = Invalid PIN (3 times)

